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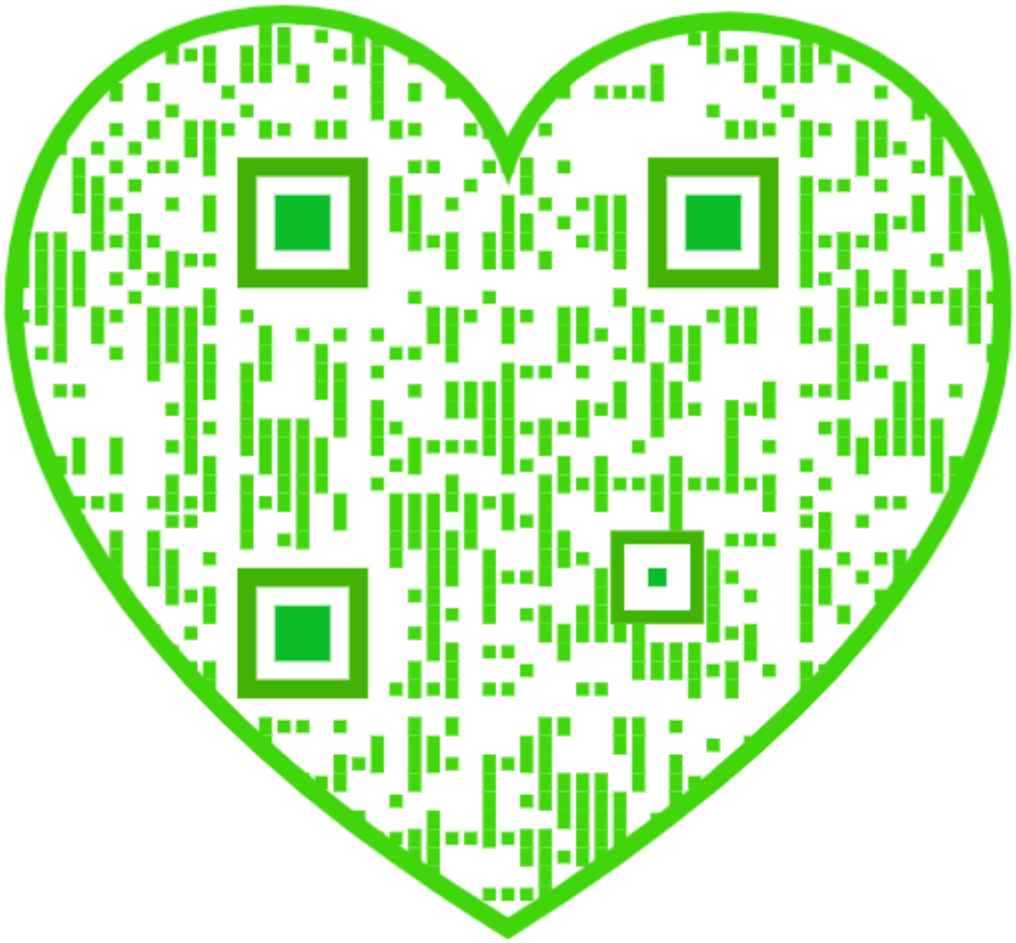
Farm Equipment Welding Plans,

Prepared in Cooperation with the Vocational Agriculture Service, University of Illinois, Urbana, Illinois



FARM EQUIPMENT WELDING PLANS

FOR FARM AND SCHOOL SHOP

THE JAMES F. LINCOLN ARC WELDING FOUNDATION

FARM EQUIPMENT WELDING PLANS

PREPARED IN COOPERATION WITH

The Vocational Agriculture Service, University of Illinois
Urbana, Illinois

Price 50c, postage paid, U. S. A.,
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Cleveland 17, Ohio

Progress is Achieved Through Study and Education

The object and purpose of the James F. Lincoln Arc Welding Foundation is to encourage and stimulate advance in the knowledge and application of the arc welding process. The Foundation was created in 1936 through Deed of Gift by The Lincoln Electric Company, Cleveland, Ohio.

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THIS BOOKLET contains detailed plans, illustrations and suggestions for making shop tools, miscellaneous farming equipment, implements, livestock equipment, and trailers. The 44 plans provide shop projects ranging from simple to fairly complex, all of which have been made in either a school or farm shop. The Vocational Agriculture Service of the University of Illinois drew the plans and prepared the bills of material from original plans submitted to The James F. Lincoln Arc Welding Foundation by students and farmers.

Grateful acknowledgement is made to the following individuals from whose original work the detailed plans were drawn:

Roy W. Brillhart, Anthony Domingos, Paul Faidley, Norman Strayer, Richard Herboldsheimer, Larry Selland, Bert Johnson, Warren Baxter, Walter Howell, Wilbur Smith, Milton Braun and Earl Kelling, Don Burroughs, Bob Radcliff, Myron Schaer and Robert Custer, Richard Paggi, Jim Gary, Richard D. Graybill, William Renniger, Arthur Benson, Keith Laper, John Edward Daugherty, John S. Garrett, Philip G. Compton, William Schuldt, Tom Fitzgerald, Lynn Pitman, Marvin W. Carpenter, Halbert W. Miller, Glen Hansen, Larry Deccio, LaVerne Sexe, Stanley Roberts, Kenneth W. Greninger, Donald Meyer, John Lockhart, Cleive Calhoun, Gerald Jessee, Kenneth Mancini, and Delmar Hanson.

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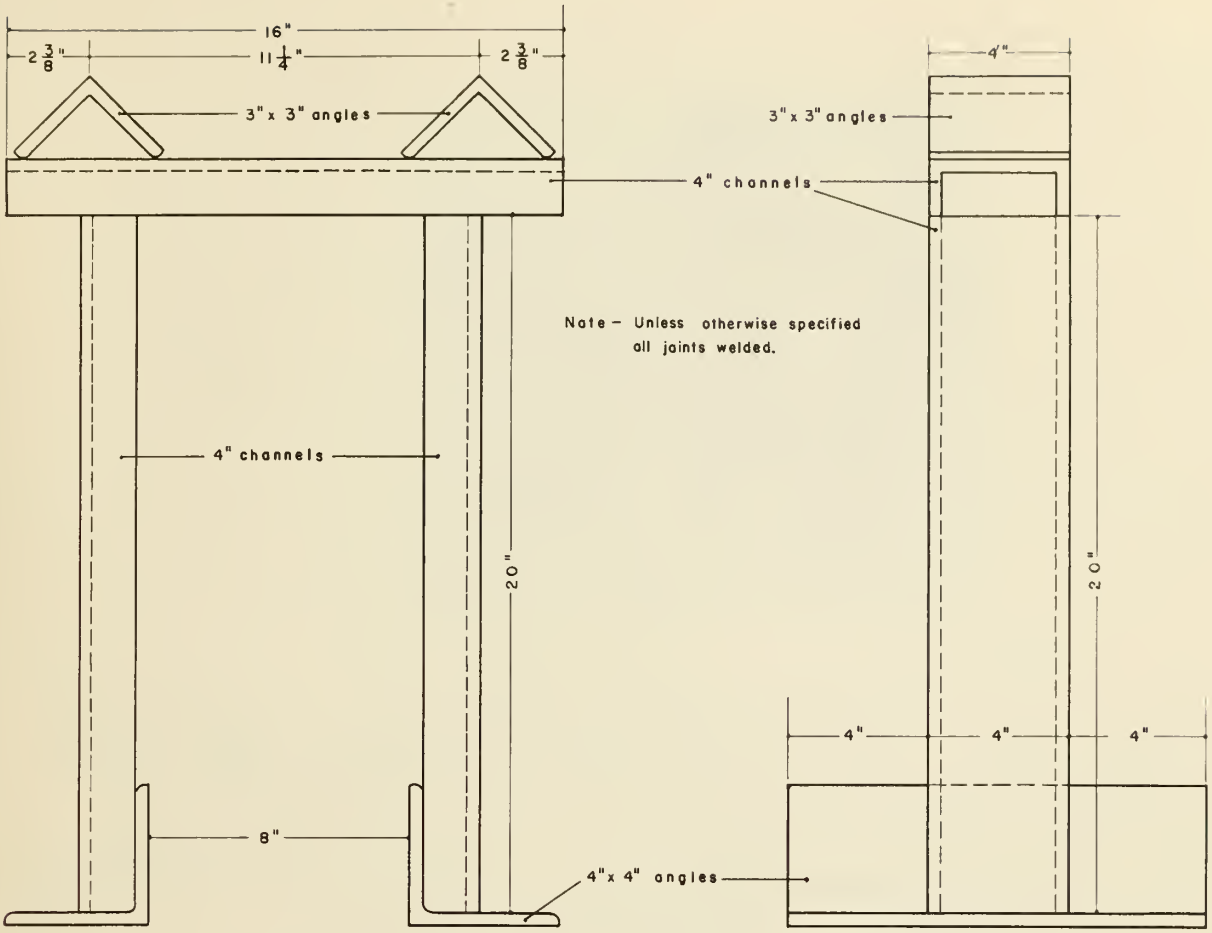
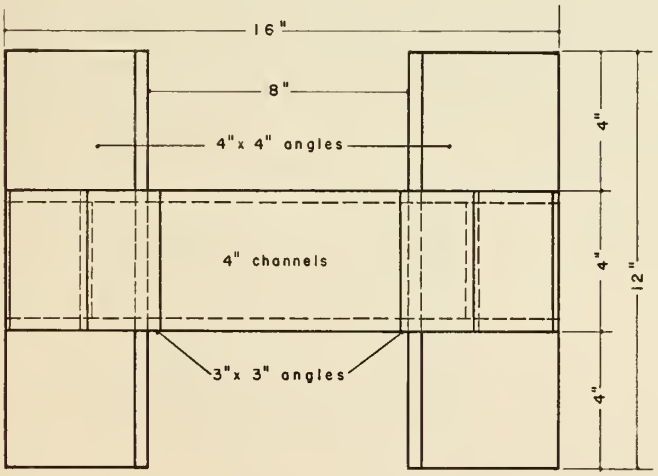
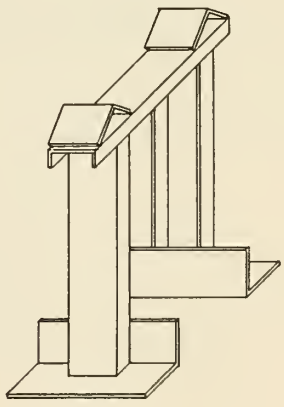
TRACTOR JACK



Front Elevation

Side Elevation





Oblique

BILL OF MATERIALS

2 pieces - 4" channel iron 20" long
1 piece - 4" channel iron 16" long
2 pieces - 3" x 3" x 1/4" angle 4" long
2 pieces - 4" x 4" x 3/8" angle 12" long

WELDING TABLE

SUGGESTED PROCEDURE

Cut out corner notches, bend, and weld the top frame together to make a rectangle. Cut 28 pieces, 1 inch long, of 1 1/4" x 1 1/4" x 3/16" angle. Weld them to the inside of the top frame end pieces to form slots to hold the removable top bars. Cut the bars to fit.

Cut and weld on the table legs, bracing each with a 12 inch piece of 3/4" x 3/4" x 1/8" angle. Weld the 16 gauge sheet steel shield in place.

Cut and weld on the flux and rod holders and the chipping hammer bracket. Note that the rod holders have covers on the bottoms which open for cleaning.

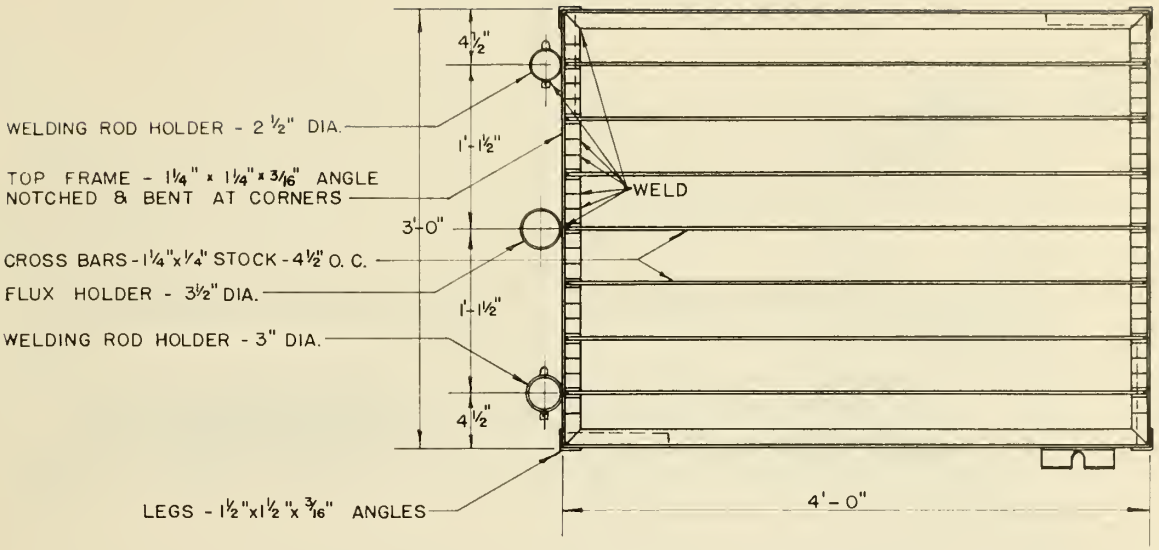
With a stool such as pictured above, you can sit down for small welding jobs and the sheet metal shield will protect your legs.

BILL OF MATERIALS

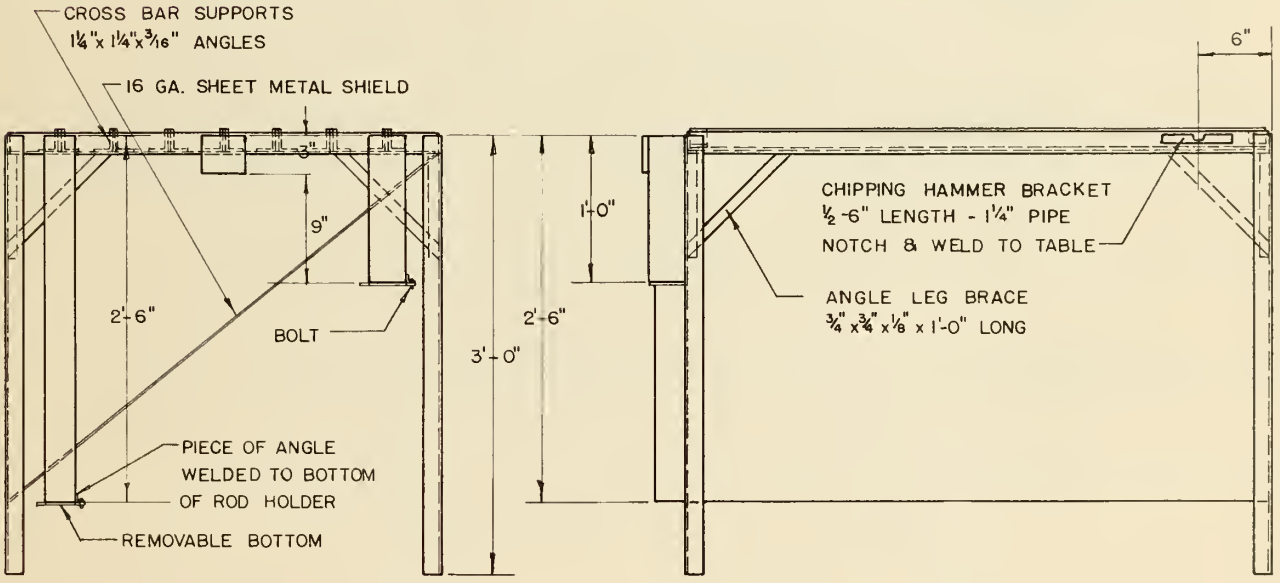
16 1/2 ft. - 1 1/4" x 1 1/4" x 3/16" angle iron
12 ft. - 1 1/2" x 1 1/2" x 3/16" angle iron
4 ft. - 3/4" x 3/4" x 1/8" angle iron
28 ft. - 1" x 1/4" flat bar stock
1 sheet - 16 gauge steel, 4' x 4'

6 in. - 1 1/2" pipe
2 1/2 ft. - 2 1/2" pipe
1 ft. - 3" pipe
2 in. - 3 1/2" pipe
Scrap steel and bolts to make covers for flux and rod holders.

* * * * *


WELDING ROD HOLDER - 2 ½" DIA.
TOP FRAME - 1¼" x 1¼" x 3/16" ANGLE NOTCHED & BENT AT CORNERS
CROSS BARS - 1¼" x ¼" STOCK - 4½" O. C.
FLUX HOLDER - 3½" DIA.
WELDING ROD HOLDER - 3" DIA.
LEGS - 1½" x 1½" x 3/16" ANGLES
4½"
1'-1½"
3'-0"
1'-1½"
4½"
WELD
4'-0"

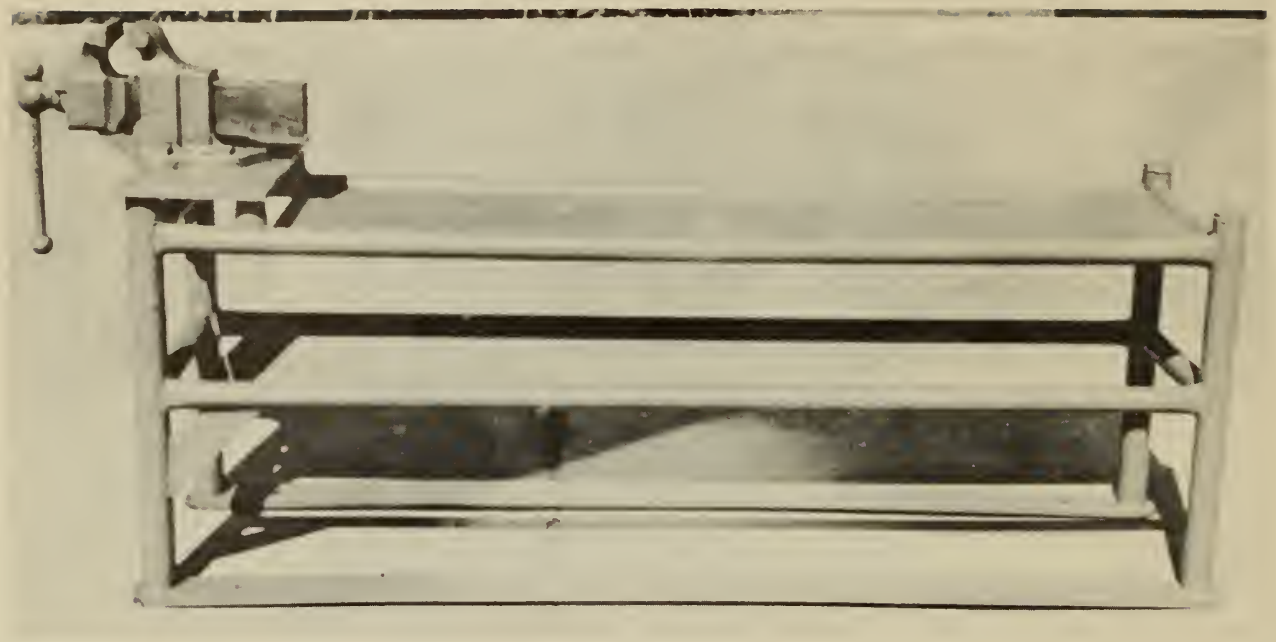
TOP VIEW


CROSS BAR SUPPORTS 1¼" x 1¼" x 3/16" ANGLES
16 GA. SHEET METAL SHIELD
3"
9"
2'-6"
BOLT
PIECE OF ANGLE WELDED TO BOTTOM OF ROD HOLDER
REMOVABLE BOTTOM
3'-0"
2'-6"
1'-0"
6"
CHIPPING HAMMER BRACKET ½-6" LENGTH - 1¼" PIPE NOTCH & WELD TO TABLE
ANGLE LEG BRACE 3/4" x 3/4" x 1/8" x 1'-0" LONG

SIDE VIEW

FRONT VIEW

WORK BENCH



SUGGESTED PROCEDURE

Cut the four legs from 2" pipe and the cross braces from 1 1/2" pipe. Flatten the ends of the braces slightly to make them fit better for welding. Weld the framework of the bench together.

Cut and weld in the small angle iron which supports the end of the bench top nearest the vise. Then cut and fit the bench top and weld it in place.

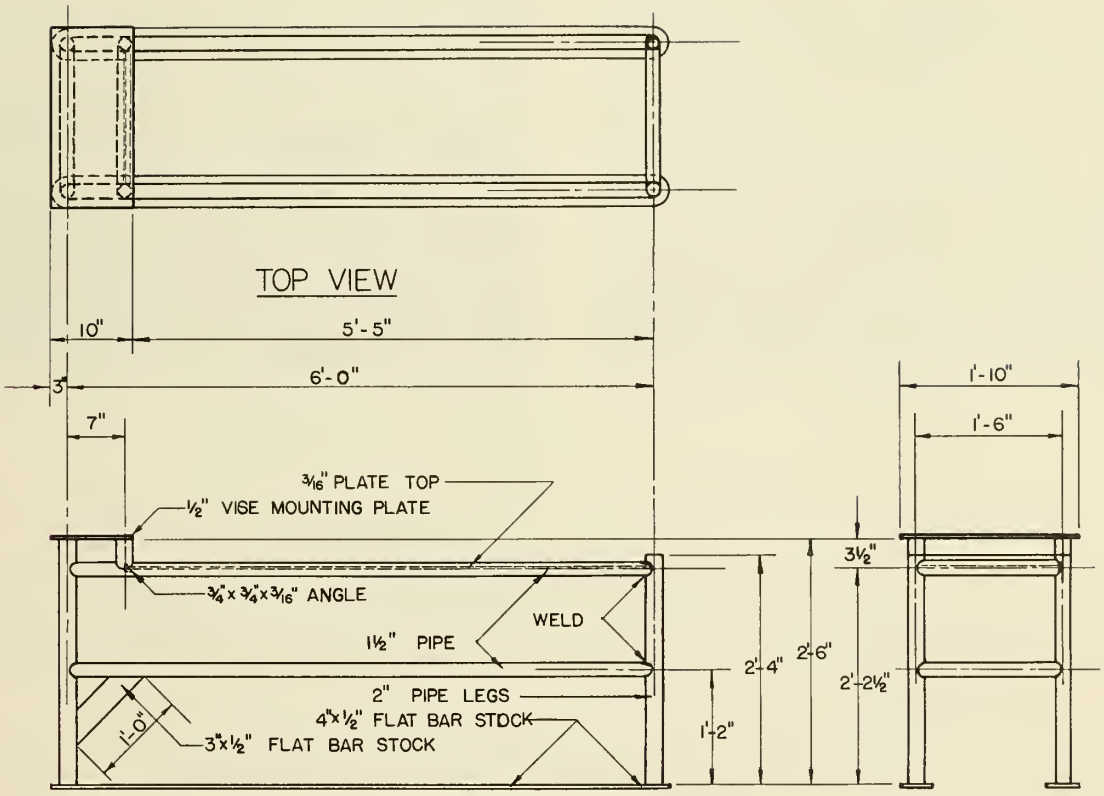
Weld on the two stubs of 1 1/2" pipe to support the vise mounting plate. Drill the mounting plate to fit the vise before welding the plate securely in place.

Complete the bench by welding in the two diagonal leg braces and welding the bottom of the legs to the 4" x 1/2" runners.

BILL OF MATERIALS

10 ft. - 2" pipe
31 ft. - 1 1/2" pipe
1 1/2 ft. - 3/4" x 3/4" x 3/16" angle
2 ft. - 3" x 1/2" plate
13 ft. - 4" x 1/2" plate
1 piece - 1/2" plate, 10" x 1' 10"
1 piece - 3/16" plate, 1' 6" x 5' 6"

* * * * *


TOP VIEW
10"
5'-5"
3"
6'-0"
7"
3/16" PLATE TOP
1/2" VISE MOUNTING PLATE
3/4" x 3/4" x 3/16" ANGLE
WELD
1 1/2" PIPE
2" PIPE LEGS
4" x 1/2" FLAT BAR STOCK
3" x 1/2" FLAT BAR STOCK
1'-0"
2'-4"
2'-6"
1'-2"
3 1/2"
2'-2 1/2"
1'-10"
1'-6"
FRONT VIEW
SIDE VIEW

ADJUSTABLE ROLLER SAW HORSE

SUGGESTED PROCEDURE

Cut the piece of 1 1/4 inch pipe for the stationary top of the horse and close ends by welding a piece of 1/4 inch plate over the openings. Drill a 5/16 inch hole in the center of each plate and tap to 3/8 inch threads.

Cut the legs and braces from 3/4 inch pipe and grind the ends to fit at the proper angles. Weld them together and to the 1 1/4 inch pipe.

Cut the end plates, grind or file the edges smooth, and drill the holes as shown in the plan.

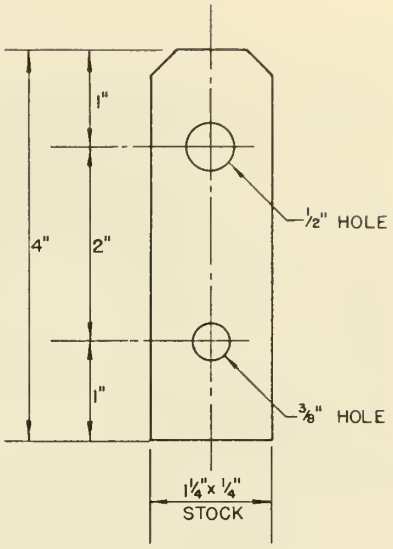
Make the roller from a piece of 3/4 inch pipe. Center and weld a flat washer on each end. Cut a piece of 1/2 inch rod to go through the roller and thread each end. Fasten it in place.

To use the horse in the roller position, raise the roller and tighten the bolts to hold it up. To use the horse as a stationary support, loosen the bolts and tilt the end plates until the roller is below the level of the rigid horse top.

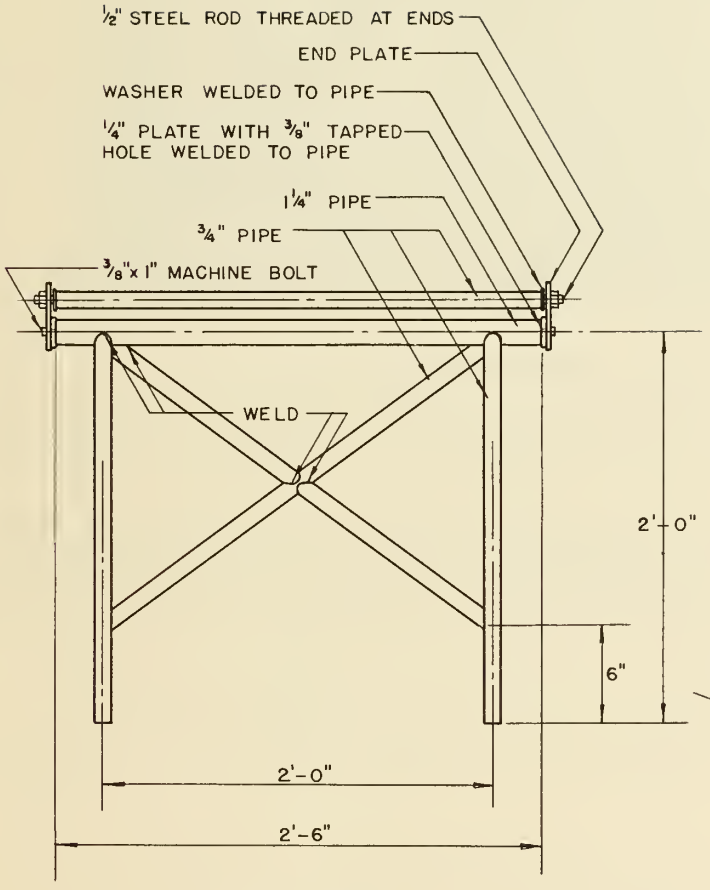
BILL OF MATERIALS

2 1/2 ft. - 1 1/4" pipe
19 ft. - 3/4" pipe
8 in. - 1 1/4" x 1/4" flat stock
3 in. - 1 1/2" x 1/4" flat stock
2 ft. 9 in. - 1/2" rod
2 - 1/2" nuts
2 - 3/8" x 1" machine bolts
2 - 7/16" flat washers (1/2" hole)

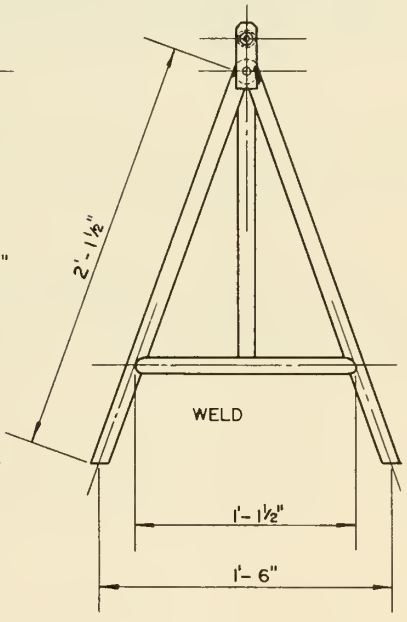
* * * * *



END PLATE DETAIL



SIDE VIEW



END VIEW

ANGLE IRON SAW HORSE

SUGGESTED PROCEDURE

It is usually desirable to make these horses in pairs. Length and height can be varied to suit your needs.

It may be desirable to make a full size drawing of the leg assembly on large paper, or with chalk on the floor. From this drawing you can obtain the correct cutting angles and set a sliding T-bevel to transfer the angles to the pieces to be cut.

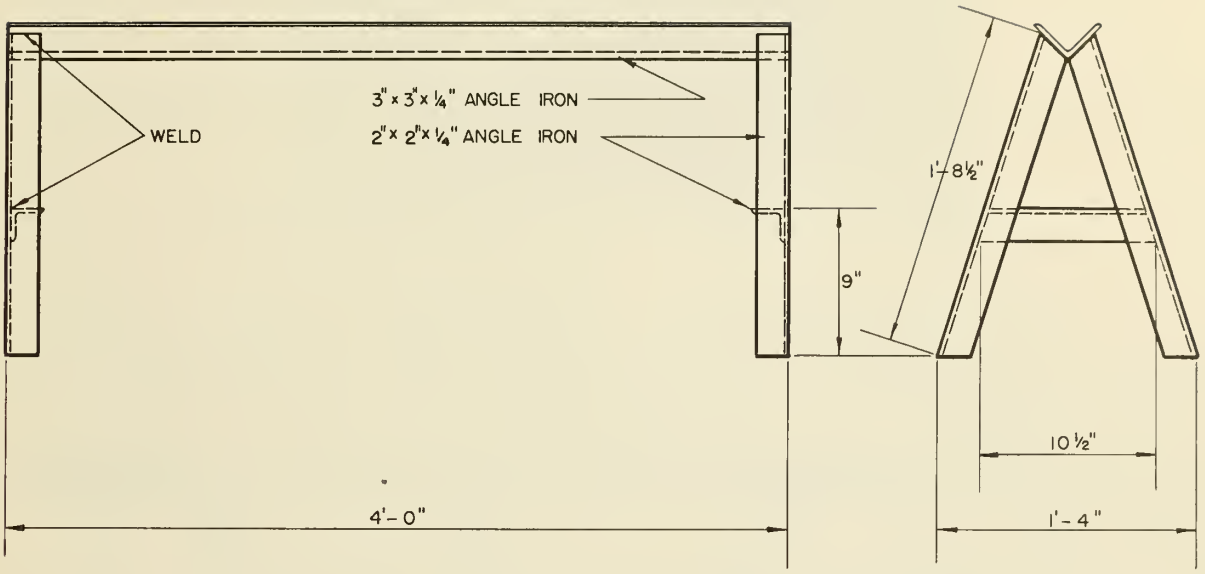
Note that the legs are not all alike but must be made in opposite pairs.

Tack weld all pieces in position and check for trueness. When true, weld them securely.

BILL OF MATERIALS

(one horse)
4 ft. - 3" x 3" x 1/4" angle
9 ft. - 2" x 2" x 1/4" angle

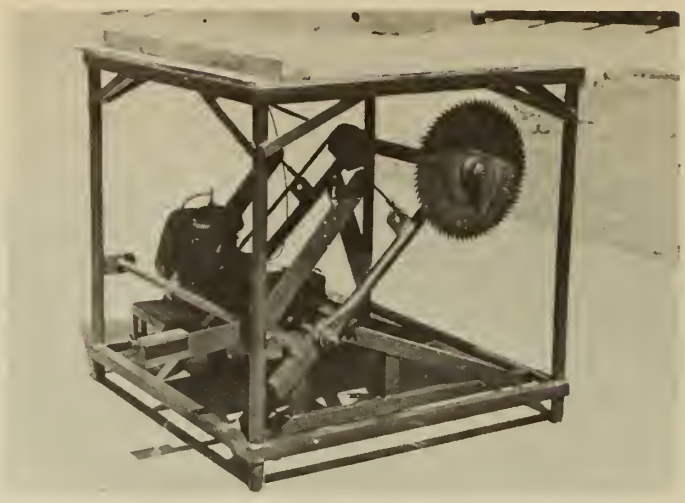
* * * * *



FRONT VIEW

SIDE VIEW

SWINGING MANDREL TABLE SAW



SUGGESTED PROCEDURE

Cut table legs and angle iron frame and weld together. Construct base support for saw mandrel frame carefully so that it is true and substantial.

Cut pipes which form frame for swinging mandrel and flatten the lower ends by heating and hammering. Holes are drilled for the shaft on which the mandrel frame pivots. Weld the mandrel frame together accurately and brace it securely.

Motor support must be built so that motor shaft and mandrel frame pivot are exactly in line with each other so that belt tightness is not affected when the saw swings.

Construct pedal assembly with arms and turnbuckles, as shown.

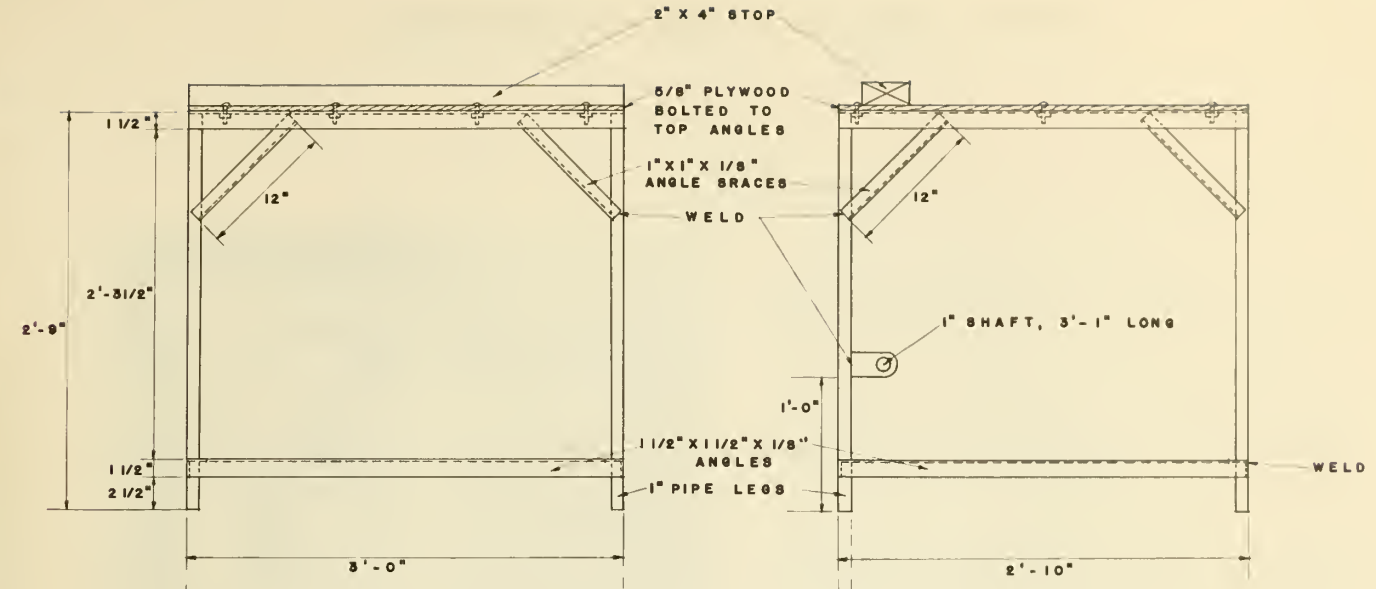
Bolt the plywood top on the table and cut a notch large enough to accomodate the saw blade. The 2" x 4" stop is bolted on in such a position that the saw will make a square cut and will cut clear through pieces held against the stop when the foot pedal is pushed clear down.

The saw, as pictured, is operated by 3 h.p. gasoline engine. It could be readily adapted for an electric motor, if desired.

BILL OF MATERIALS

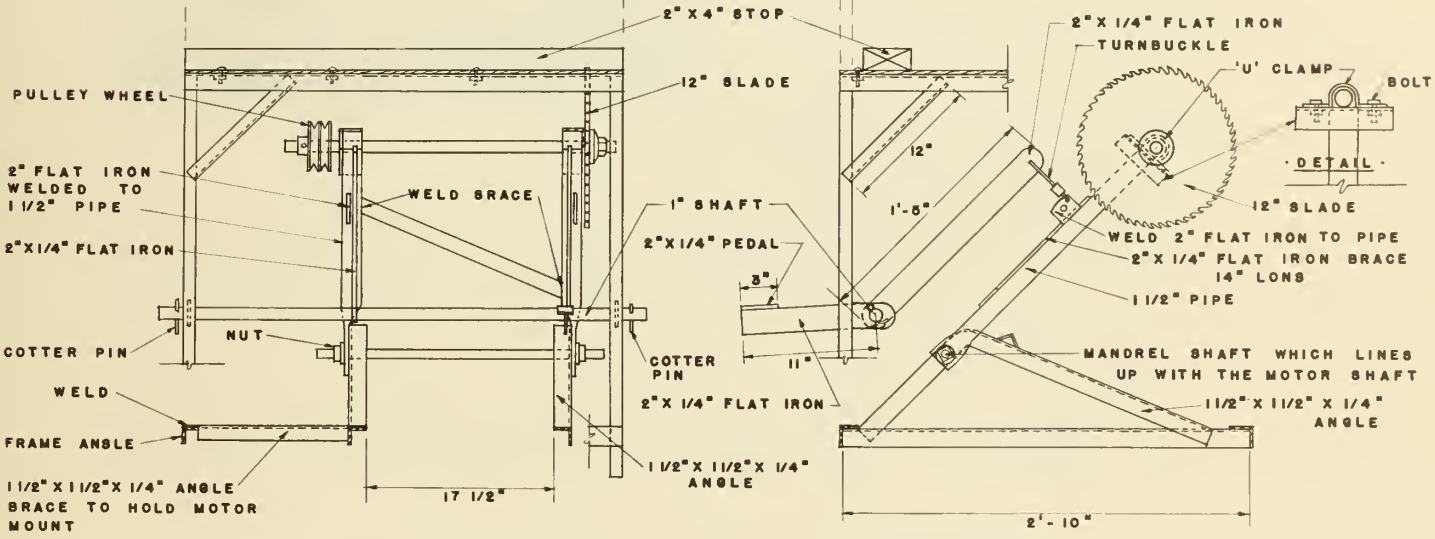
11 ft. 1" pipe
4 ft. 1 1/2" pipe
24 ft. 1 1/2" x 1 1/2" x 1/8" angle iron
16 ft. 1 1/2" x 1 1/2" x 1/4" angle
14 ft. 1" x 1" x 1/8" angle
8 ft. 2" x 1/4" flat bar stock
1 1/2 ft. 1 1/2" x 1/4" flat bar stock
3 1/2 ft. 1" shafting
2 ft. 5/8" rod with 2 nuts and washers
2 ft. 1/2" rod with 4 nuts and washers
2 turnbuckles
11 sq. ft. 5/8" plywood
1 - 2" x 4" x 3'
1 Saw mandrel with bearing pulleys, and 12 inch cut-off blade
1 3 h.p. gas engine.
bolts, cotter, welding rod.

* * * * *



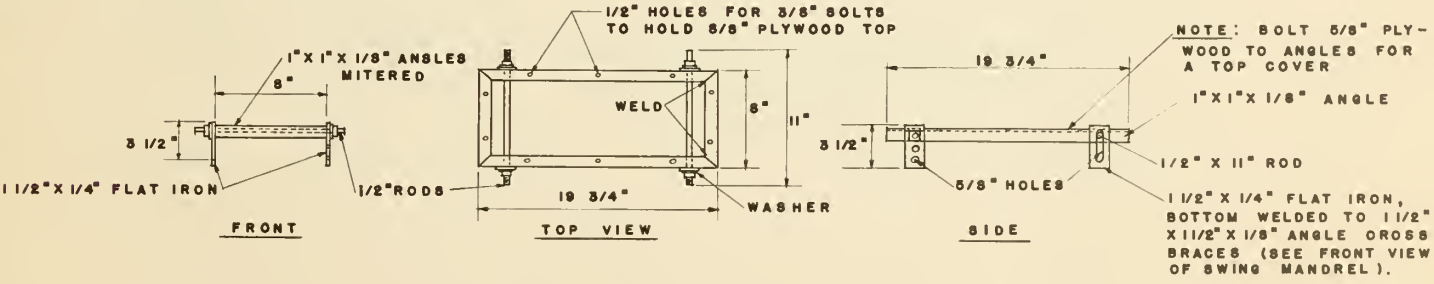
FRAME - FRONT VIEW

FRAME - SIDE VIEW



SWING MANDREL - FRONT

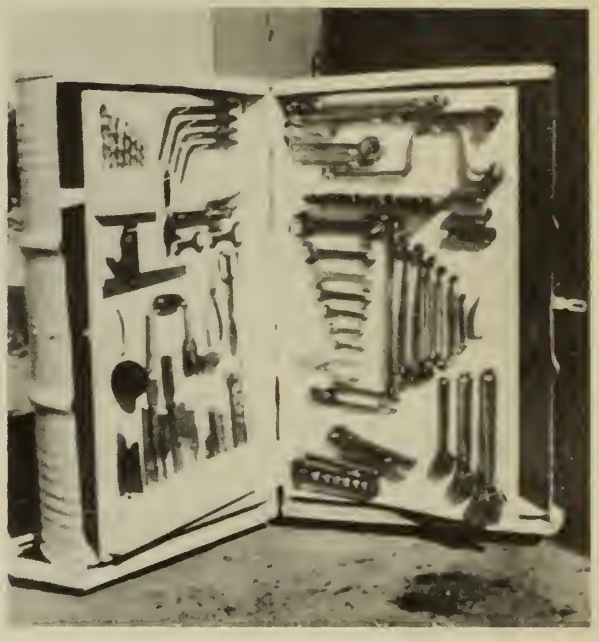
SWING MANDREL - SIDE


1/2" HOLES FOR 5/8" BOLTS TO HOLD 5/8" PLYWOOD TOP
1" X 1" X 1/8" ANGLES MITERED
8"
3 1/2"
1 1/2"X 1/4" FLAT IRON
1/2"RODS
FRONT
WELD
6"
11"
19 3/4"
WASHER
TOP VIEW
NOTE: BOLT 5/8" PLYWOOD TO ANGLES FOR A TOP COVER
19 3/4"
1"X1"X 1/8" ANGLE
3 1/2"
1/2" X 11" ROD
5/8" HOLES
1 1/2" X 1/4" FLAT IRON, BOTTOM WELDED TO 1 1/2" X 1 1/2" X 1/8" ANGLE CROSS BRACES (SEE FRONT VIEW OF SWING MANDREL).
SIDE

MOTOR MOUNT

PORTABLE TOOL CABINET

SUGGESTED PROCEDURE



Split a 55 gallon oil drum lengthwise. The safest and best way to do this is to use a very sharp cold chisel and a heavy hammer. Bend the cut edges back double with a pair of pliers to make them smooth.

Construct the two bases out of angle iron. Weld three butt hinges on the outside of the two halves of the barrel so that it will open and close in its original position. Weld the halves onto the two angle iron bases. Weld or bolt the four heavy casters to the bases as shown.

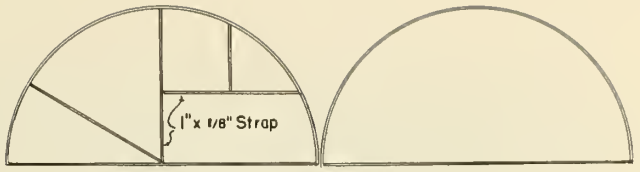
Cut two pieces of 3/4" plywood to make the inner doors or tool panels. Weld two tee hinges on the inside of the barrel for each panel, spacing them about 2-1/2" away from the crack to allow room between the panels for mounting tools on each. Bolt the panels to these hinges. Barn door handles and friction catches may also be used to control the panels. Weld a hasp on the outside of the barrel.

Light strap iron partitions can be welded on top of one or both barrel halves to provide space for small parts, screws, etc.

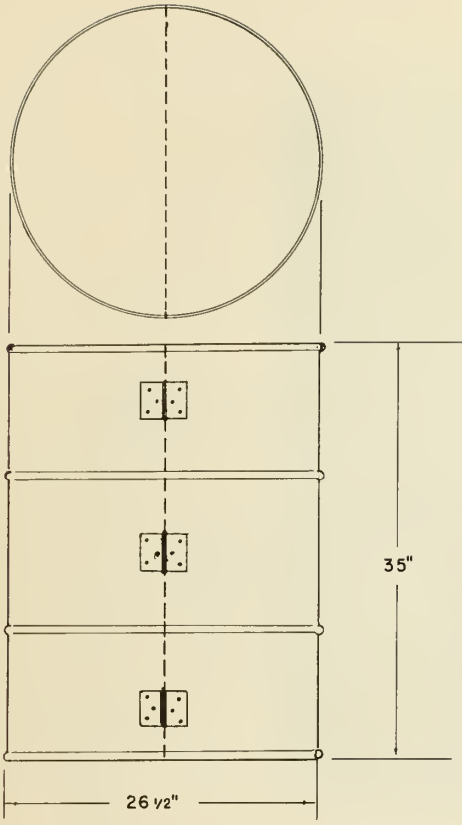
BILL OF MATERIALS

1	55 gallon oil drum
4 pcs.	1" x 1" x 3/16" angle iron, 25-1/2" long
4 pcs.	1" x 1" x 3/16" angle iron, 13-1/4" long
1 pc.	1" x 1/8" strap iron, 3'8" long
2 pcs.	3/4" plywood, 25" x 33"
4	3" plate casters
3	3" butt hinges
4	3" tee hinges
1	hasp
2	barn door handles
2	friction catches

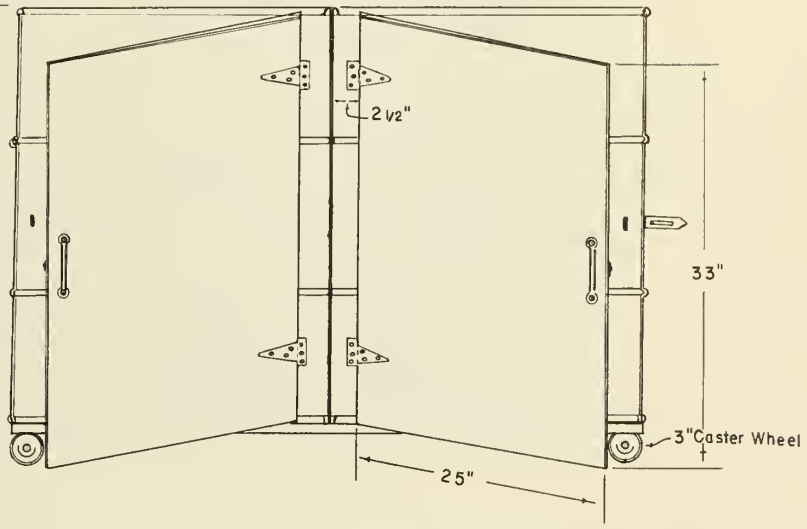
* * * * *



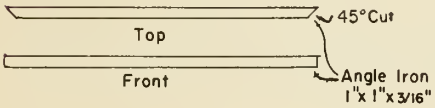
TOP VIEW – CABINET AND PARTITIONS



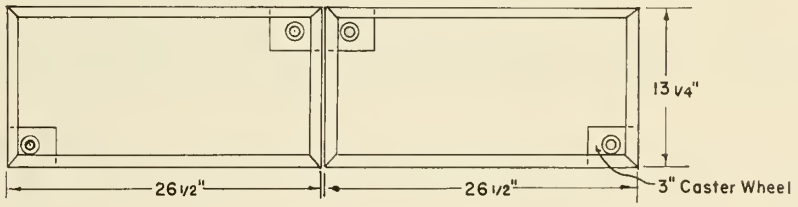
TOP AND SIDE VIEWS – BARREL



FRONT VIEW – CABINET AND INNER DOORS FOR TOOLS



VIEW – BASE PIECES



VIEW – BASE ASSEMBLY

FUEL BARREL STAND

SUGGESTED PROCEDURE

Cut the pieces of 1 1/2" pipe for the legs and crosspieces. A better fit for welding can be obtained by flattening the ends of the crosspieces slightly. Weld the main frame together.

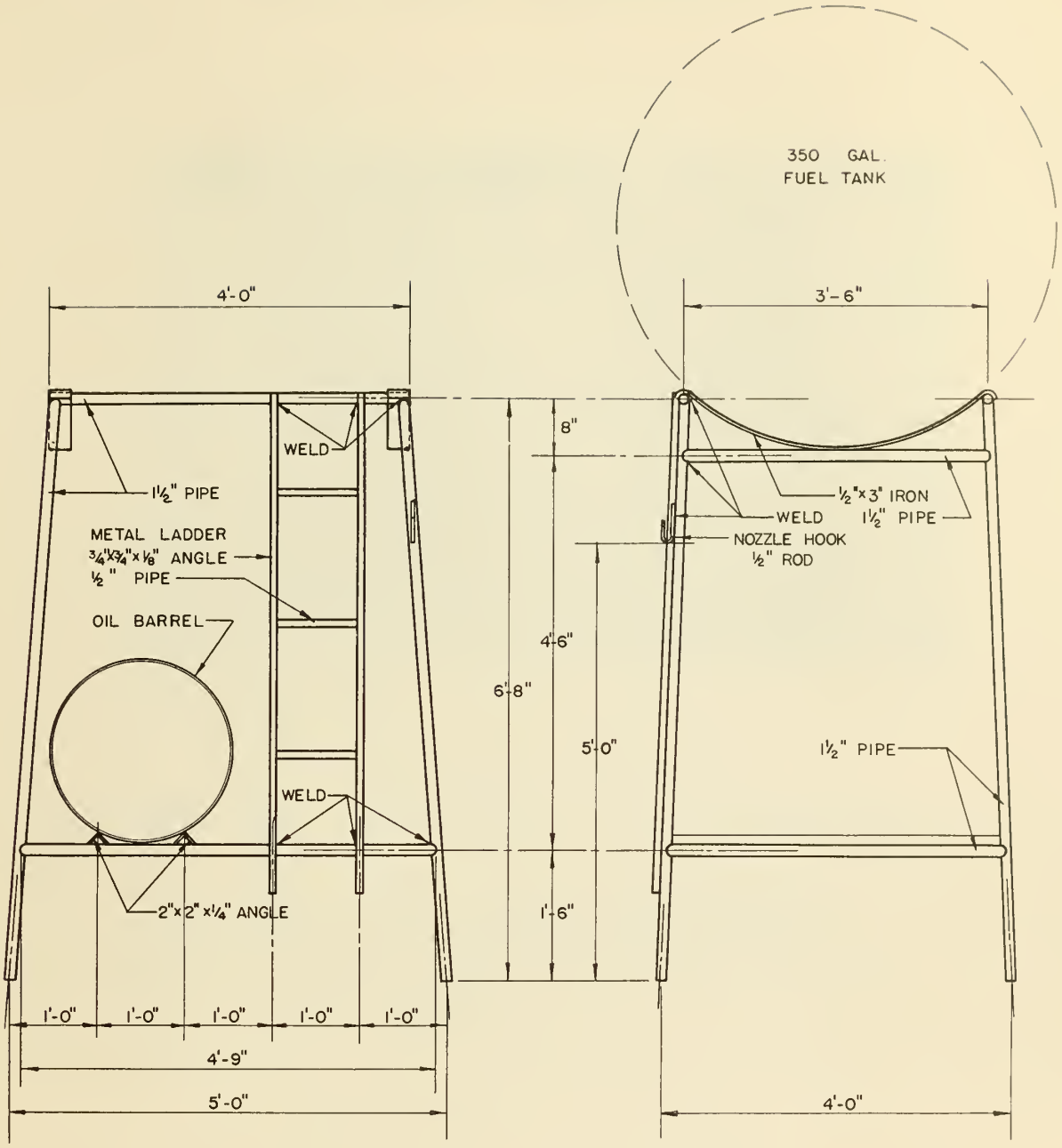
Form the curved pieces of 1/2" x 3" iron to fit the fuel tank used. In the original, these were pieces of wide wagon tire. Form the ends to hook over the top crosspieces and weld the pieces in place.

Complete the fuel stand by constructing the ladder, welding the two angle irons in place to support an oil barrel, and forming a hook from 1/2" rod to hold the hose nozzle.

BILL OF MATERIALS

60 ft. - 1 1/2" pipe
8 1/2 ft. - 3" x 1/2" flat iron
8 ft. - 2" x 2" x 1/4" angle
12 ft. - 3/4" x 3/4" x 1/8" angle
3 ft. - 1/2" pipe
1 ft. - 1/2" rod

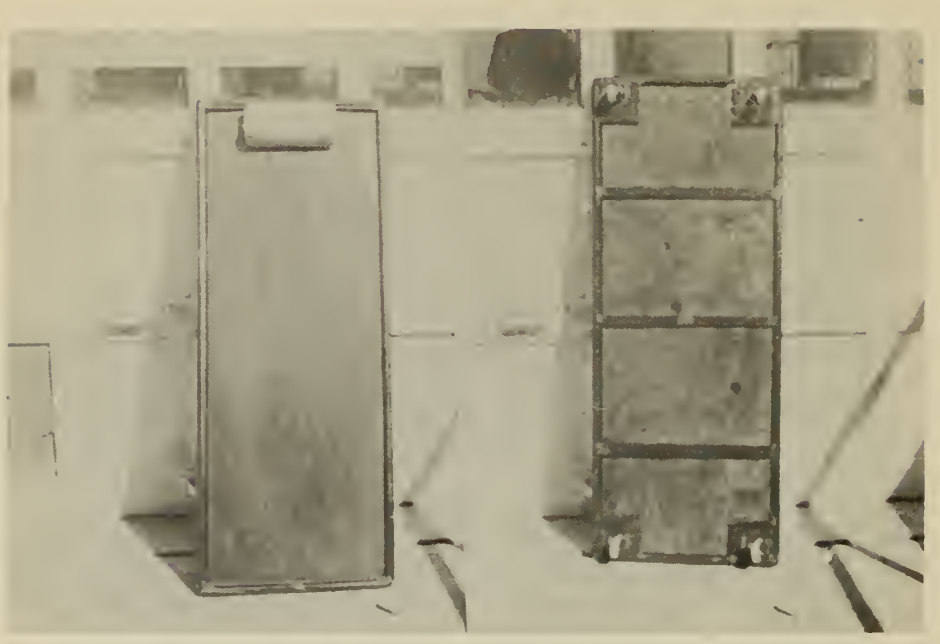
* * * * *



SIDE VIEW

END VIEW

MECHANICS CREEPER



SUGGESTED PROCEDURE

Cut the pipe frame pieces, making 45 degree miter cuts. Weld the frame together to form a rectangle.

Cut and weld the three flat braces in place. Also weld the 4" square plates in the corners. Drill the plates to fit the holes in the plate casters.

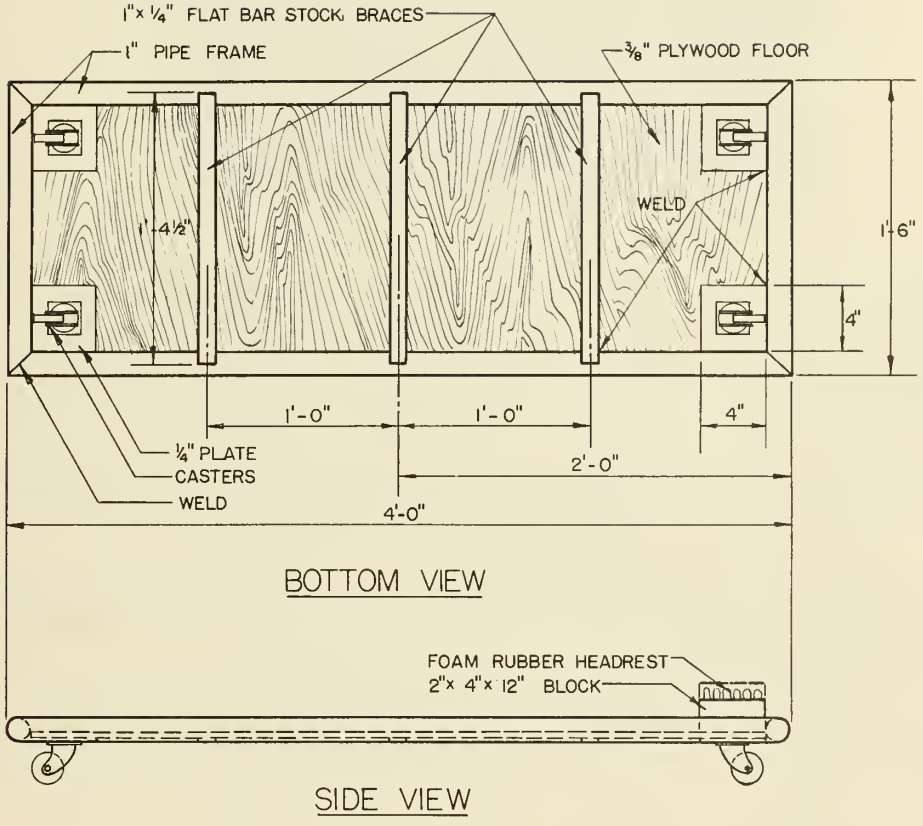
Cut a piece of 3/8" plywood to fit inside the frame, resting on the corner plates and the cross braces. Bolt this in place with flat head stove bolts.

Fasten the 2" x 4" block to the plywood and cover it with foam rubber to make the head rest.

BILL OF MATERIALS

11 ft. - 1" pipe (3/4" or 1/2" pipe may be preferred)
4 - 4" square pieces of 1/4" plate
4 1/2 ft. - 1" x 1/4" flat bar stock
Set of 4 - plate casters
Sheet of 3/8" or 1/4" plywood, 1 1/2' x 4'
2" x 4" block, 1' long
Foam Rubber
3/16" or 1/4" flat head stove bolts

* * * * *


1"x 1/4" FLAT BAR STOCK BRACES
1" PIPE FRAME
3/8" PLYWOOD FLOOR
1'-4 1/2"
WELD
1'-6"
4"
1'-0"
1'-0"
4"
1/4" PLATE
CASTERS
WELD
2'-0"
4'-0"
BOTTOM VIEW
FOAM RUBBER HEADREST
2"x 4"x 12" BLOCK
SIDE VIEW

OVERHEAD HOIST

SUGGESTED PROCEDURE

Cut the 6" x 6" angle base members and the 3" x 3" upright members to rough length. Mark the proper angles on the long pieces, perhaps from a scale outline chalked on the floor. Cut out the upper ends to receive the 5" I-beam. Then weld the two triangles together. Note the 6" gusset plates where the 3" angles join the 6" angle.

Prepare the I-beam by welding on the 7" square plates in the center to support the fixed pulley. Also weld on the loop used to attach the end of the cable to the I-beam.

Weld the I-beam in place, laying the hoist over first on one side and then on the other. Also weld in the 6" x 6" x 1/2" triangular reinforcements between the I-beam and the angle legs.

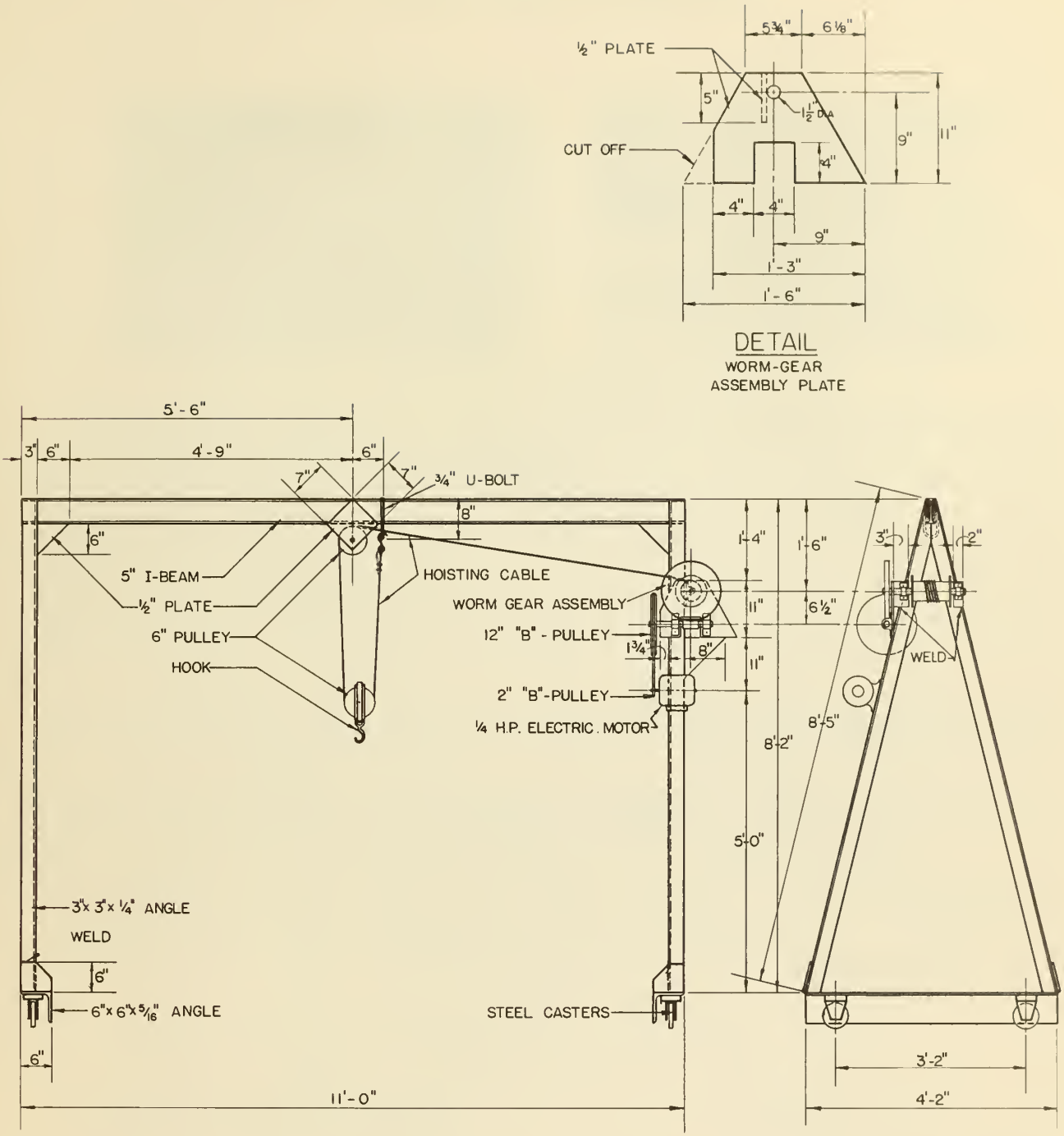
Mount the worm-gear hoist assembly and the motor, equipped with a reversing switch, and attach the cable. Bolt or weld the casters in place to complete the hoist.

If parts to make the hoist electric powered are not available, a hand-operated winch or a chain hoist may be used.

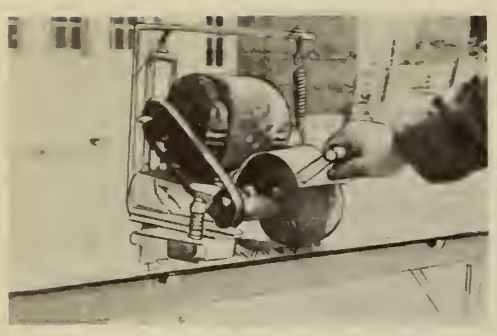
BILL OF MATERIALS

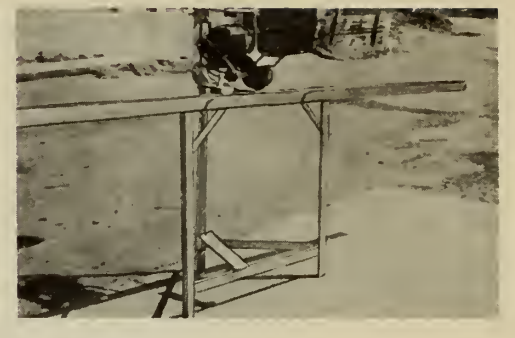
11' - 5" I-beam
8' 4" - 6" x 6" x 5/16" angle
34' - 3" x 3" x 1/4" angle
6 pieces - 1/2" plate, 6" square
2 pieces - 1/2" plate, 7" square
1 piece - 1/2" plate, 1' x 1' 6"
1' 6" - 3/4" rod
Worm gear assembly - about 100:1 ratio
12" V-pulley, Size B
2" V-pulley, Size B
Size B V-belt
1/4 h.p. motor with reversing switch
25 ft. - 3/8" wire rope (cable)
1-6" - wire rope sheave
1-6" - wire rope snatch block
Set of 4 - 6" steel casters
Miscellaneous bolts and steel for mounting hoist.

* * * * *


½" PLATE
5¾"
6⅛"
5"
1½ DIA
CUT OFF
9"
11"
4"
4"
4"
9"
1'-3"
1'-6"
DETAIL
WORM-GEAR
ASSEMBLY PLATE
5'-6"
3"
6"
4'-9"
6"
7"
7"
¾" U-BOLT
8"
6"
5" I-BEAM
½" PLATE
6" PULLEY
HOOK
HOISTING CABLE
WORM GEAR ASSEMBLY
12" "B" - PULLEY
1¾"
8"
2" "B"-PULLEY
¼ H.P. ELECTRIC MOTOR
1'-4"
1'-6"
11"
6½"
11"
8'-2"
5'-0"
3"
2"
WELD
8'-5"
3"x 3"x ¼" ANGLE
WELD
6"
6"x 6"x 5/16" ANGLE
STEEL CASTERS
6"
11'-0"
3'-2"
4'-2"
FRONT VIEW
SIDE VIEW

SICKLE GRINDER





SUGGESTED PROCEDURE

Cut the three angle iron legs and the long piece for the sickle table. Weld the two front legs to the sickle table, bracing them diagonally with the 3/4" x 1/4" pieces. Cut and weld on the lower cross piece between the front legs.

Join the rear leg to the front assembly as shown in the top view of the plan. Note that the 2" x 1/4" x 10" flat piece is welded to the top of the leg and to the two pieces of 1 1/2" x 1/4" x 10" which extend back from the sickle table and meet in the form of a V. This piece also has a diagonal brace running down to the rear leg. Cut and attach the lower cross pieces which support the rear leg.

Make the sickle clamp assembly with its foot control as shown in the plan. The sickle is held in place by the clamp under spring pressure and is released by depressing the foot control. Make and weld the sickle guides in place.

Form the U-shaped motor and grinder support by bending it from a piece of 2" x 1/4" stock 3' 3" long. Weld it in place and stabilize it with triangular pieces of 1/4" plate welded inside the right angle bends.

Construct the motor and grinder mount. Note that the handle is attached to the grinding wheel shield. The rear motor support will pivot or swivel and the front support is a spring which will permit the grinder to be lowered against the sickle with a medium hand pressure.

BILL OF MATERIALS

10' 3" - 2" x 2" x 3/8" angle iron
8' 3" - 1 1/2" x 1 1/2" x 1/4" angle
4' 6" - 2" x 1/4" flat stock
8' 3" - 1 1/2" x 1/4" flat stock
4' - 3/4" x 1/4" flat stock
1' 6" - 4" x 1/8" flat stock
1' - 2 1/2" x 1/8" flat stock
1' 1" - 2" x 1/8" flat stock
1' 6" - 3/4" x 1/8" flat stock
1 piece - 1/4" plate, 4" x 4"
1 piece - 1/4" plate, 6" x 8"
1 ft. - 1/2" pipe
4 - 1/4" x 3" machine bolts
1 - 3/8" x 4 1/2" machine bolt
8 - 3/8" x 1" machine bolts
1 - compression spring
1 - extension spring
2' - light chain
1 - 1/4 h.p. motor, pulleys, belt
1 - mandrel and bearing
1 - sickle grinding wheel

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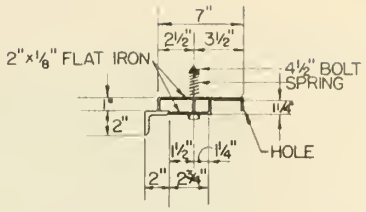
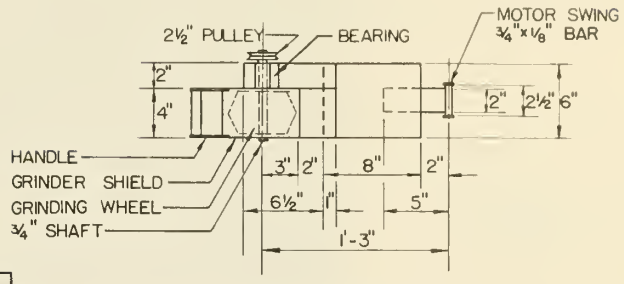
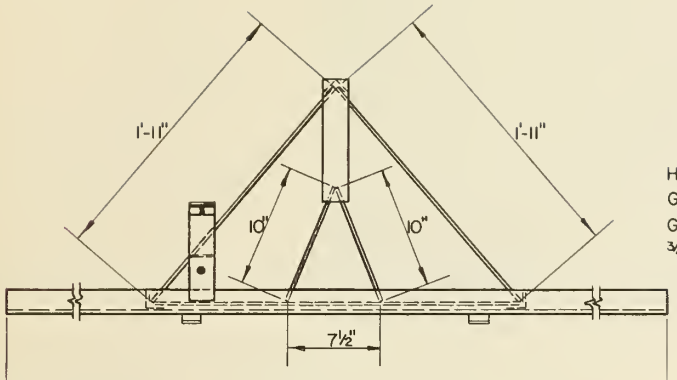


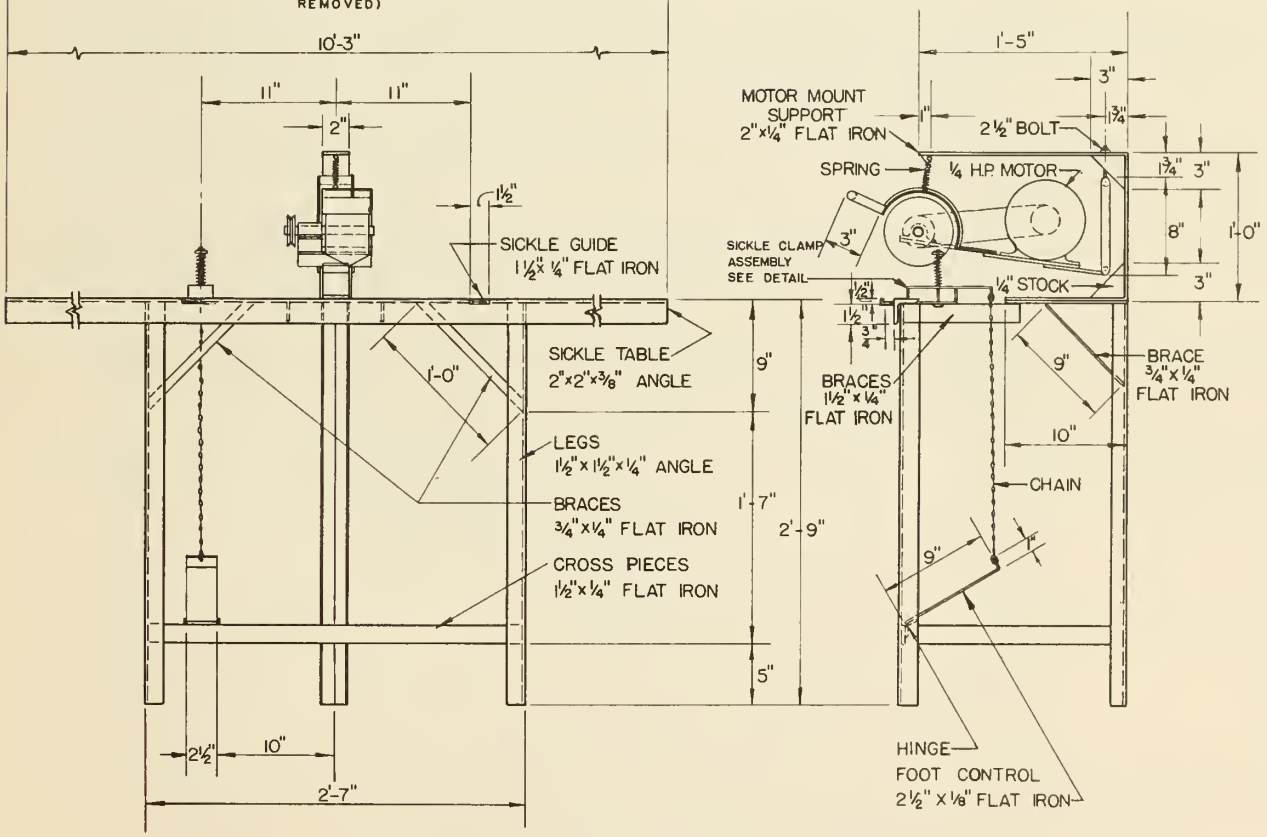
DETAIL-SICKLE CLAMP ASSEMBLY



DETAIL
GRINDING WHEEL-MOTOR MOUNTING



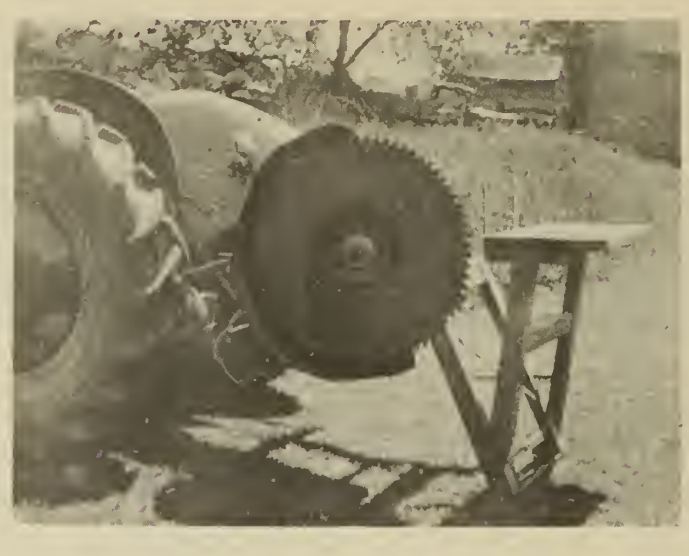
TOP VIEW
(GRINDING WHEEL & MOTOR MOUNTING REMOVED)



FRONT VIEW

SIDE VIEW

TRACTOR MOUNTED BUZZ SAW



SUGGESTED PROCEDURE

Secure blade and mandrel from old stationary-type buzz saw. Cut angle irons and weld together to make frame. Mount frame rigidly on tractor drawbar so that it is level when rear legs rest on the ground.

Bolt mandrel in place and line pulley with tractor belt pulley. Construct and mount metal guard for saw.

Construct hinged saw table. Adjust spring tension so that table returns freely but can be pushed forward easily. Table top should be made of oak or other hard wood.

The saw shown in this plan was built for left hand operation. Parts should be reversed for right hand use.

BILL OF MATERIALS

18 ft. 2 1/2" x 2 1/2" x 1/4" angle iron
4 ft. 1 1/4" x 1 1/4" x 1/4" angle iron
4 ft. 2 1/2" x 1/4" band iron
5 ft. 1" x 1/4" band iron
6 ft. 3/4" x 1/4" band iron
2 1/2 ft. 5/8" rod
6 sq. ft. 16 gauge sheet metal
Bolts, springs, welding rod
Belt
1" x 12" x 2 ft. oak board
Old saw and mandrel

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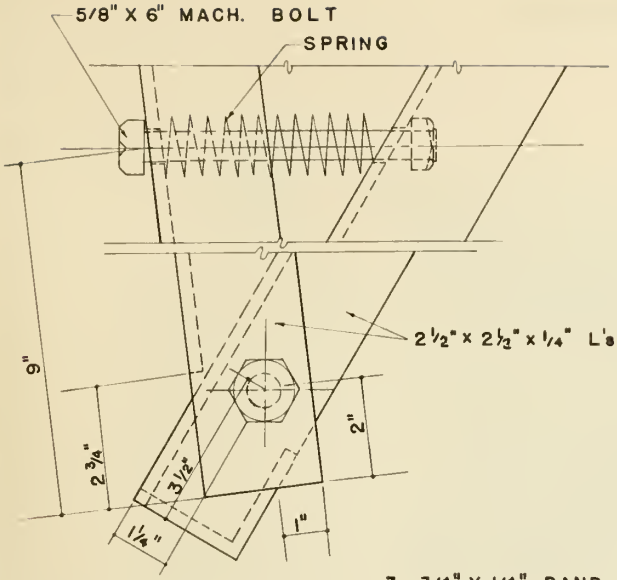
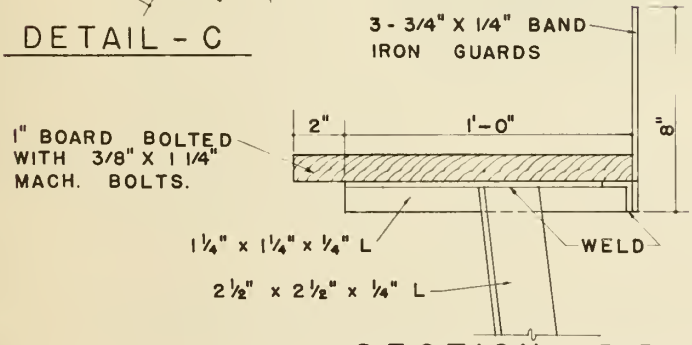
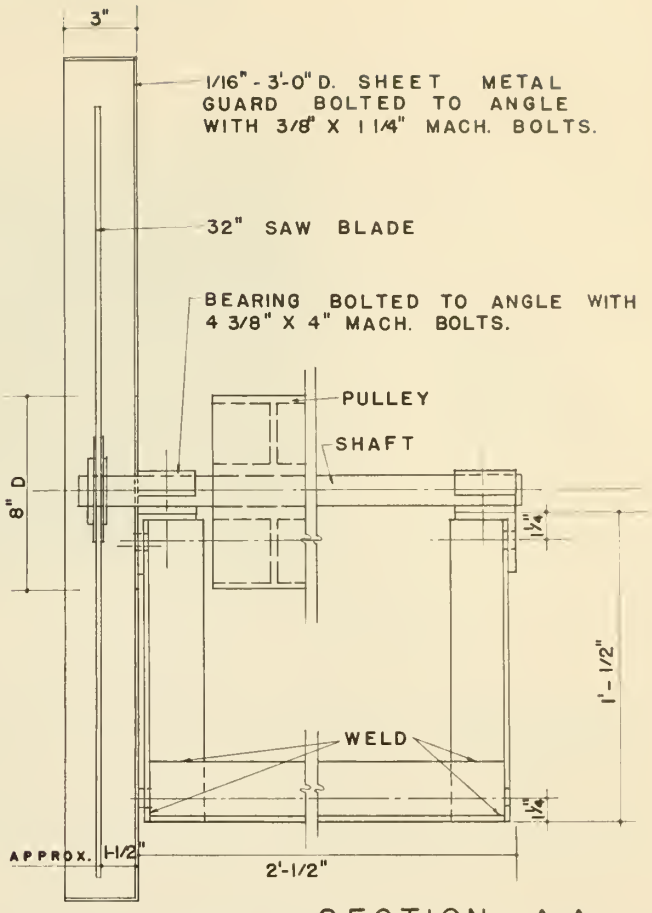


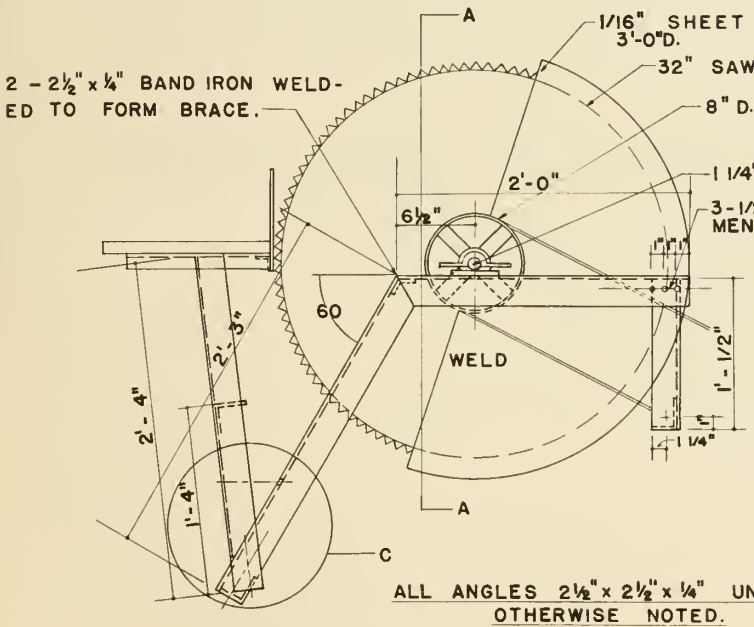
DETAIL - C



SECTION B-B

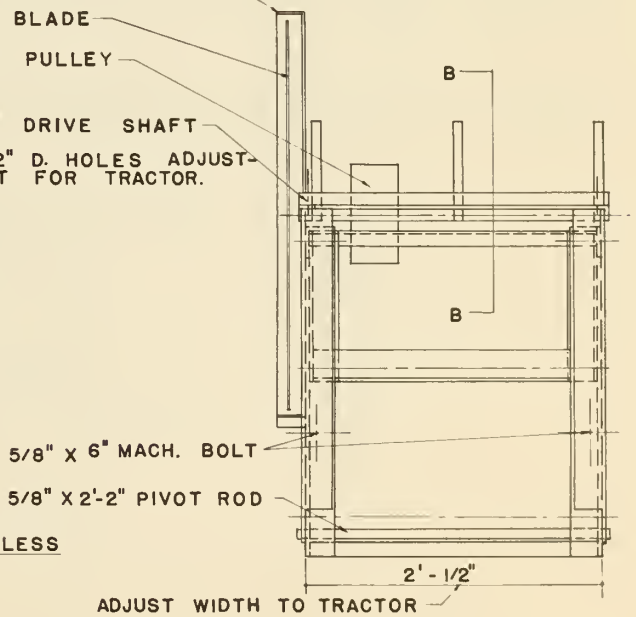


SECTION A-A



ALL ANGLES 2½" x 2½" x ¼" UNLESS OTHERWISE NOTED.

RIGHT SIDE VIEW



END VIEW

WHEELBARROW

SUGGESTED PROCEDURE

Bend the two pieces of 3/4" pipe to form the side frame pieces. Drill and weld the strap iron wheel supports on the ends of the side pieces.

Bend the legs and weld them to the side frame pieces. Weld the crosspieces to the frame and the diagonal leg braces in place. Bolt the wheel in position.

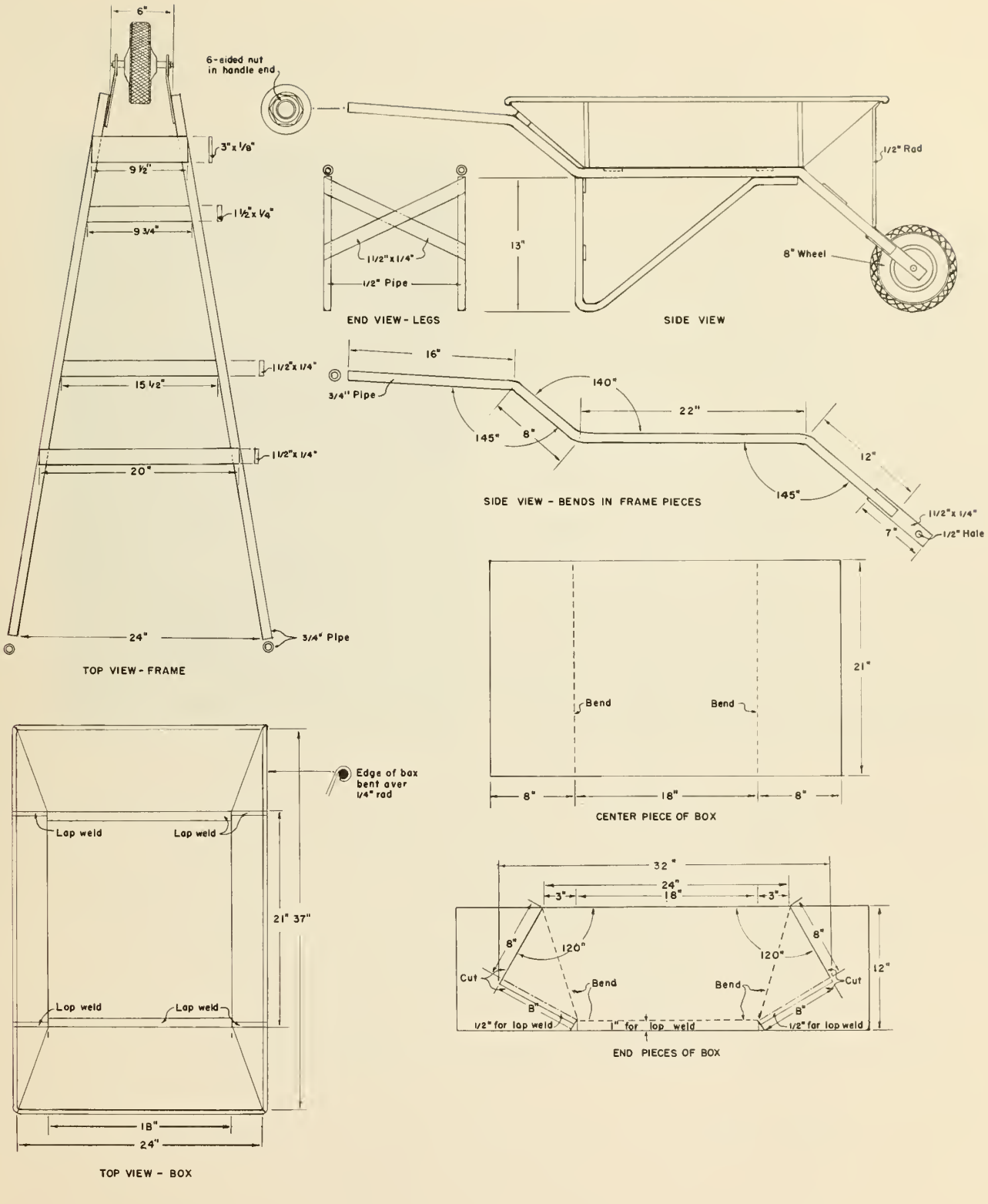
Lay out the pattern for the box on three pieces of 22-gauge black sheet iron. Cut and bend as shown. Weld the pieces together carefully to avoid burning through. Finish the edges of the box by rolling them over a 1/4" rod and welding at intervals.

Bolt the box to the frame and weld the front rod braces in place. Ends of the handles can be plugged by welding 6-sided nuts in them and filing smooth.

BILL OF MATERIALS

2 pcs.	3/4" pipe, 4'10" long
2 pcs.	1/2" pipe, 3'2" long
9-1/2"	3" x 1/8" flat stock
7'8"	1-1/2" x 1/4" flat stock
1 pc.	22 guage black iron, 21" x 34"
2 pcs.	22 gauge black iron, 12" x 32"
10'2"	1/4" rod
2'	1/2" rod
1	8" rubber tired wheel, 1/2" bore
1	1/2" x 6" machine bolt
2	1/2" six-sided nuts

* * * * *


6"
6-sided nut in handle end
3" x 1/8"
9 1/2"
1 1/2" x 1/4"
9 3/4"
1 1/2" x 1/4"
15 1/2"
1 1/2" x 1/4"
20"
24"
3/4" Pipe
TOP VIEW - FRAME
1 1/2" x 1/4"
1/2" Pipe
13"
END VIEW - LEGS
1/2" Rod
8" Wheel
SIDE VIEW
16"
3/4" Pipe
140°
22"
145°
8"
12"
145°
1 1/2" x 1/4"
7"
1/2" Hole
SIDE VIEW - BENDS IN FRAME PIECES
21"
Bend
Bend
8"
18"
8"
CENTER PIECE OF BOX
Edge of box bent over 1/4" rod
Lap weld
Lap weld
21" 37"
Lap weld
Lap weld
18"
24"
TOP VIEW - BOX
32"
24"
18"
3"
3"
8"
120°
8"
120°
Cut
Bend
Bend
Cut
12"
8"
8"
1/2" for lap weld
1" for lap weld
1/2" for lap weld
END PIECES OF BOX

BAG CART

SUGGESTED PROCEDURE

Cut pipe to length and bend to form handles with a conduit bender. Cross-pieces are curved slightly but center upright is straight. Bend ends of lower crosspiece at right angles to form axle holders. 1/2" holes are drilled near the ends of these for the rod which serves as an axle.

Cut bottom plate to size, chamfer front corners, and grind edges smooth. Drill small holes near ends of axle for cotters.

All parts are welded together. Axle is inserted in 1/2" holes and welded in place. If desired, washers may be welded on the axle to keep wheels from rubbing on frame. Wheels are held on axle with a second washer and cotter pin.

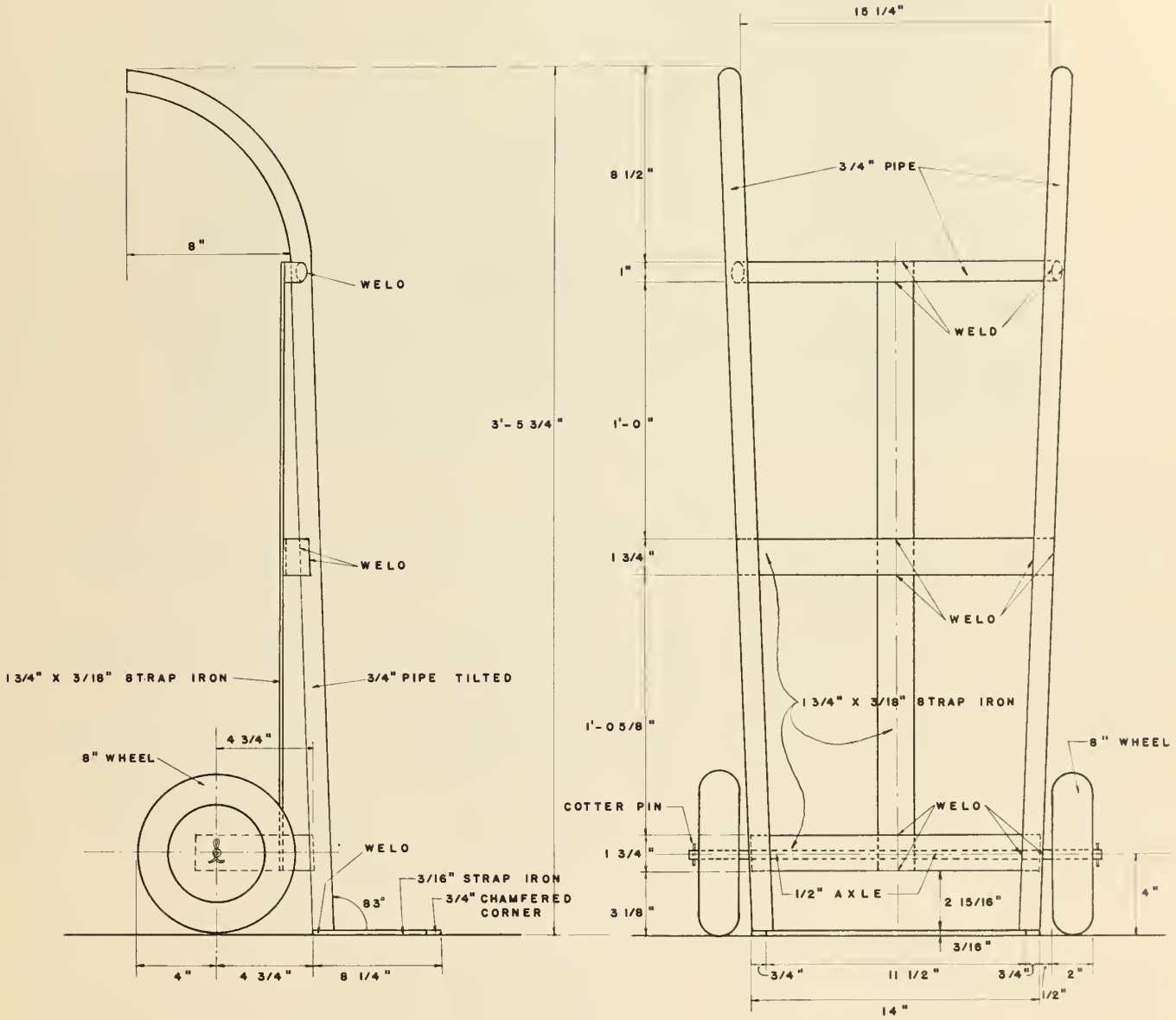
BILL OF MATERIALS

9 ft. - 3/4" pipe or rigid conduit
6 ft. - 1 3/4" x 3/16" strap iron
1 piece - 6 1/4" x 14" x 3/16" plate
1 piece - 1/2" rod, 1' 8" long
4 - 1/2" washers
2 - cotter pins
2 - 2" x 8" rubber-tired, ball-bearing wheels.

* * * * *

NOTE:

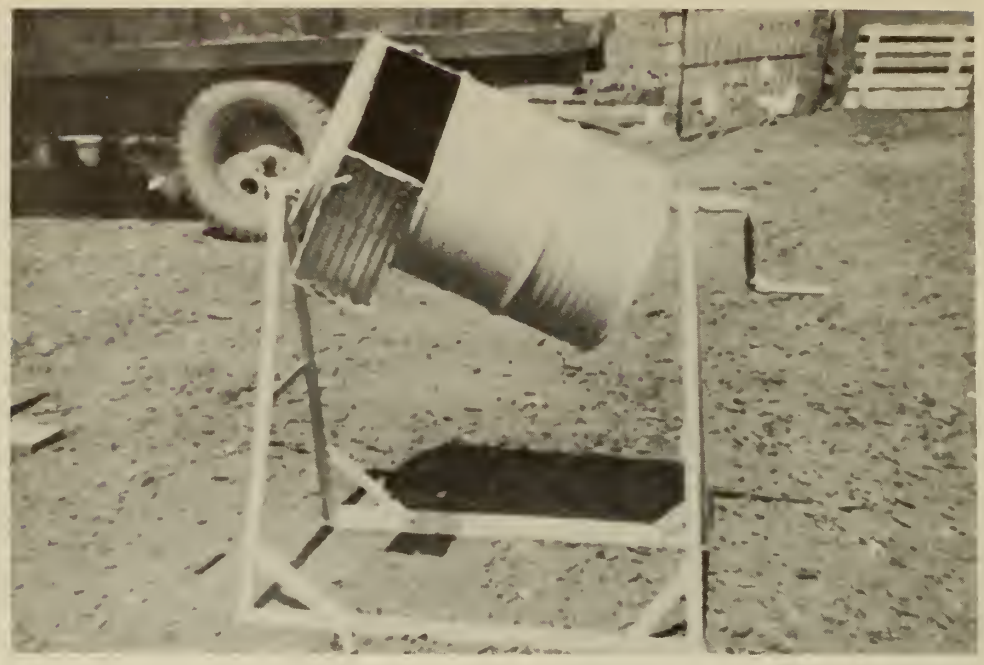
ALL PIPES AND PLATES SHOULD BE BENT TO SHAPE WITH A PIPE BENDER BEFORE WELDED IN PLACE.



SIDE VIEW

FRONT VIEW

BARREL SEED TREATER



SUGGESTED PROCEDURE

Secure a good 30 gallon barrel and punch a hole in each end, near opposite edges large enough to insert a 3/4" pipe axle. Weld the axle to the barrel, leaving about 6 inches sticking out at each end.

Cut out an opening in the barrel in the position shown a little smaller than 8" x 12" so the sheet metal door will cover it. Fasten the door with a pair of hinges at one end and with a window fastener at the other.

Cut short sections of 1" pipe to serve as bearings and file them out so that they will slip over the axle. Then weld up the end frames to hold the bearings.

Weld the angle irons on the lower ends of the legs and brace them as shown. Make the crank and attach it by means of a threaded coupling. Note that the handle is free to turn in your hand as the barrel is cranked.

BILL OF MATERIALS

1 - 30-gallon drum
5 1/2 ft. - 3/4" pipe
14 1/2 ft. - 1" pipe
3 inches - 1/2" pipe
6 ft. - 1 1/2" x 1 1/2" x 1/4" angle
6 ft. - 1 1/2" x 1/4" flat bar stock
1 - 3/4" pipe coupling
1 - 3/4" elbow
1 - 3/8" x 4 1/2" carriage bolt with washer
1 piece - sheet metal, 8" x 12"
1 pair hinges
1 window fastener

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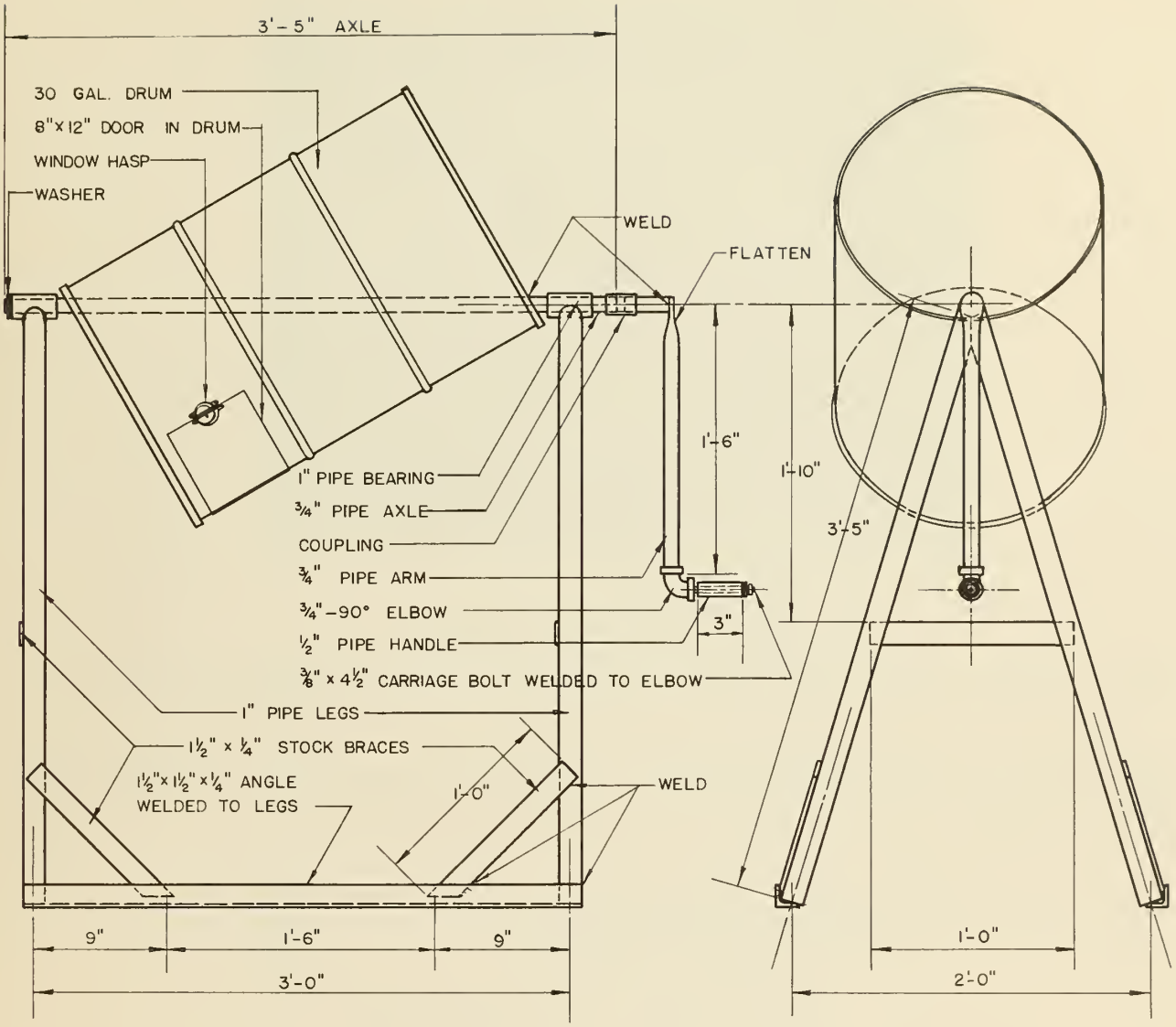

SIDE VIEW

END VIEW

TREE PLANTER BAR

SUGGESTED PROCEDURE

Cut a section from a heavy truck spring leaf, heat and forge it to shape with a chisel edge.

Cut the pipe for the handle, flatten a section of the lower end, and bend the offset as shown. Weld the handle onto the blade and weld the crosspiece on the upper end.

Cut and weld the foot step and step brace in place. To complete the job, re-heat and temper the cutting edge of the blade.

BILL OF MATERIALS

5 ft. - 3/4" pipe
9 in. - 1" x 1/4" flat stock
6 in. - 2 1/2" x 1/4" flat stock
Section of truck spring leaf, 3" x 12"

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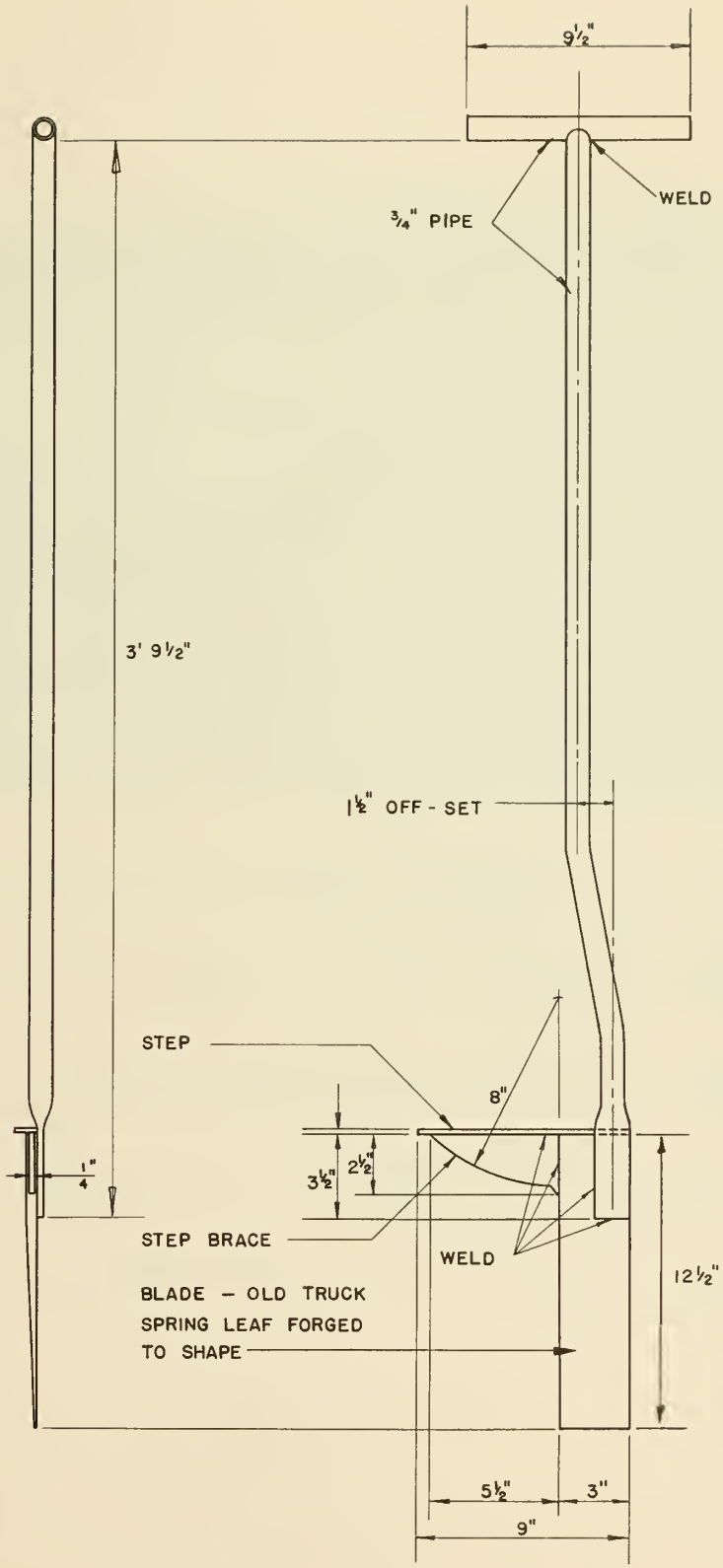
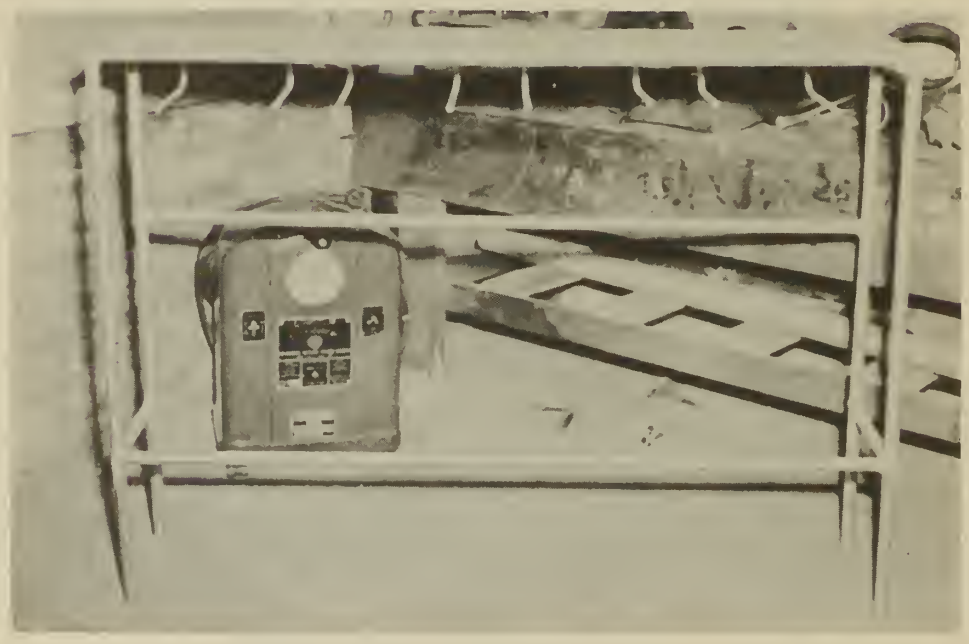

9½"
WELD
¾" PIPE
3' 9½"
1½" OFF - SET
STEP
8"
2½"
3½"
1"
4
STEP BRACE
WELD
12½"
BLADE – OLD TRUCK
SPRING LEAF FORGED
TO SHAPE
5½"
3"
9"

MILK CAN, LID AND UTENSIL RACK



SUGGESTED PROCEDURE

Cut the pieces for the top frame at 45 degree angles to form miter joints at the corners. Weld them together to make a rectangle. Space the center pair of long pieces in the top frame and weld them in place.

Cut and weld on the four legs, using a square to line them up. Then weld in the lower leg braces and the front and back milk can support members.

The can lid holders are made of 1/2 inch rods which are cut and bent to shape. They are then welded to the underside of the top rear frame member.

This rack as shown is designed for 4 cans but the length can be increased to make room for 6, 8, or more.

BILL OF MATERIALS

48 ft. - 3/4" pipe
8 ft. - 1/2" rod

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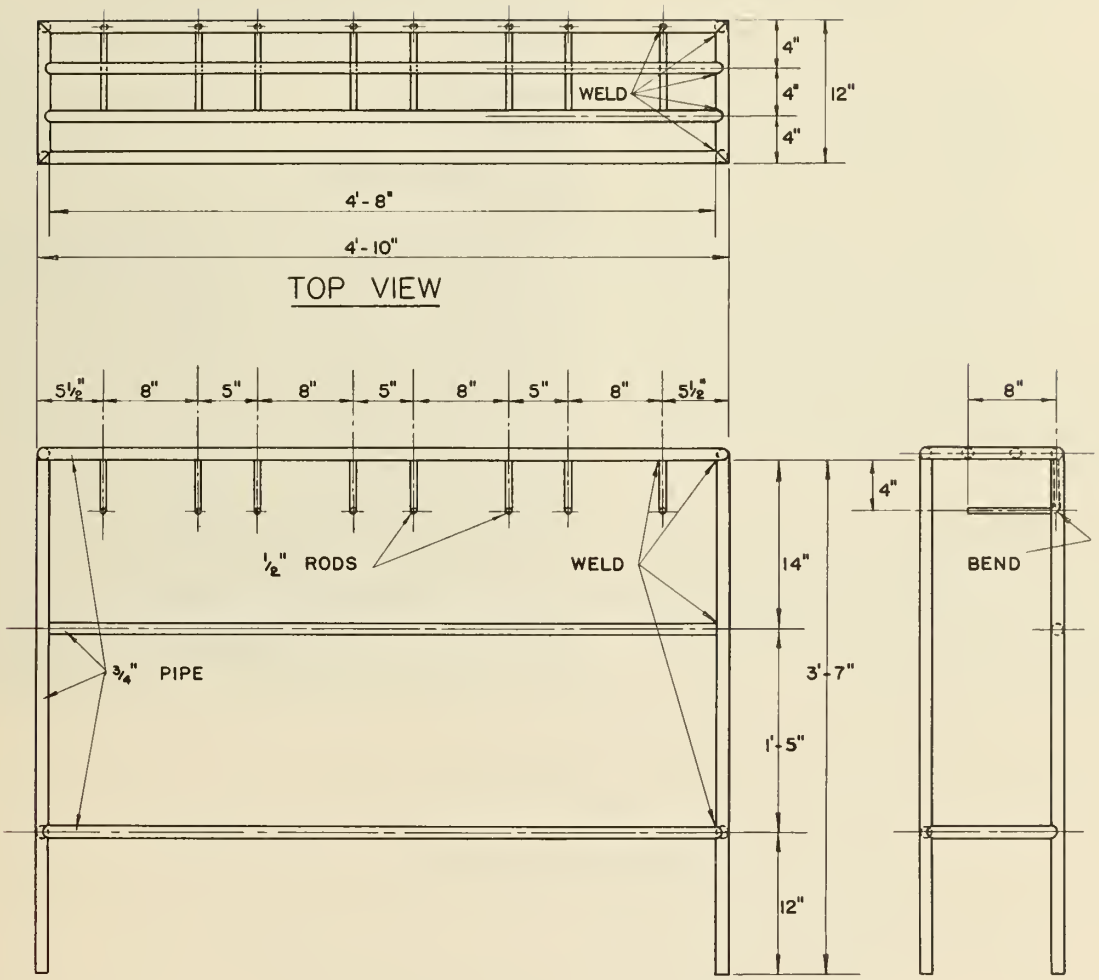

4"
4"
12"
WELD
4'-8"
4'-10"
TOP VIEW
5½"
8"
5"
8"
5"
8"
5"
8"
5½"
½" RODS
WELD
14"
3'-7"
1'-5"
12"
¾" PIPE
4"
8"
BEND
FRONT VIEW
SIDE VIEW

POST PULLER

SUGGESTED PROCEDURE

Cut out a round notch in the base plate so that the jack will fit up to a post. Cut and weld the two angle iron uprights to the base plate, spacing them 1 1/4" apart.

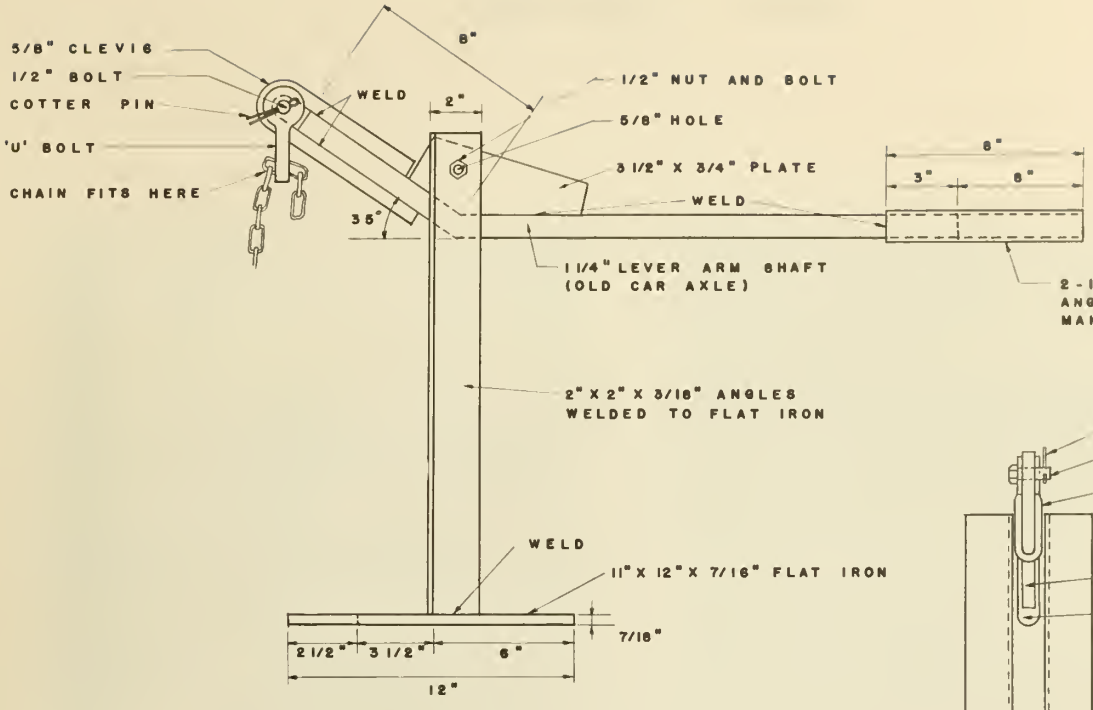
Secure a piece of 1 1/4" shafting or piece of old car axle. Heat and bend as shown. Weld a U-shaped rod around the end of the shaft to hold the clevise. Cut and weld a piece of heavy plate in the curved part of the lever. Drill this plate and the two upright pieces for 1/2 inch bolt.

Two pieces of 1 1/4" angle iron are welded on the handle end of the lever in the form of a box so that a longer bar can be used to increase the leverage if desired.

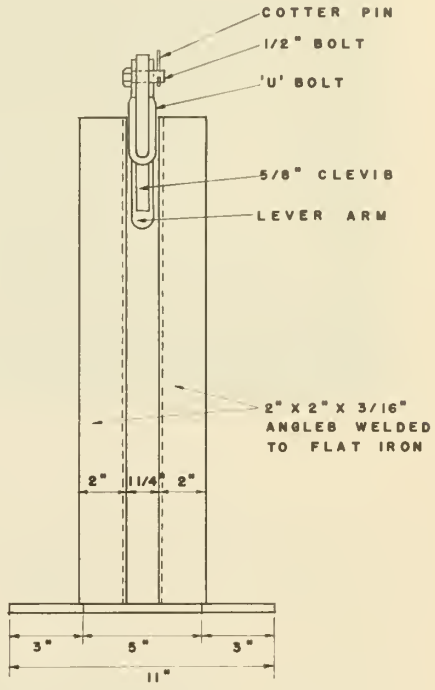
BILL OF MATERIALS

1 piece of 7/16" plate, 11" x 12"
3 ft. 2" x 2" x 3/16" angle iron
1 piece of 3/4" plate, 3 1/2" x 8"
1 ft. 5/8" rod
1 Clevise and chain
2 pieces 1 1/4" x 1 1/4" x 1/8" angle iron
1 1/2" x 2 1/2" bolt
1 old car axle or piece of 1" shaft

* * * * *



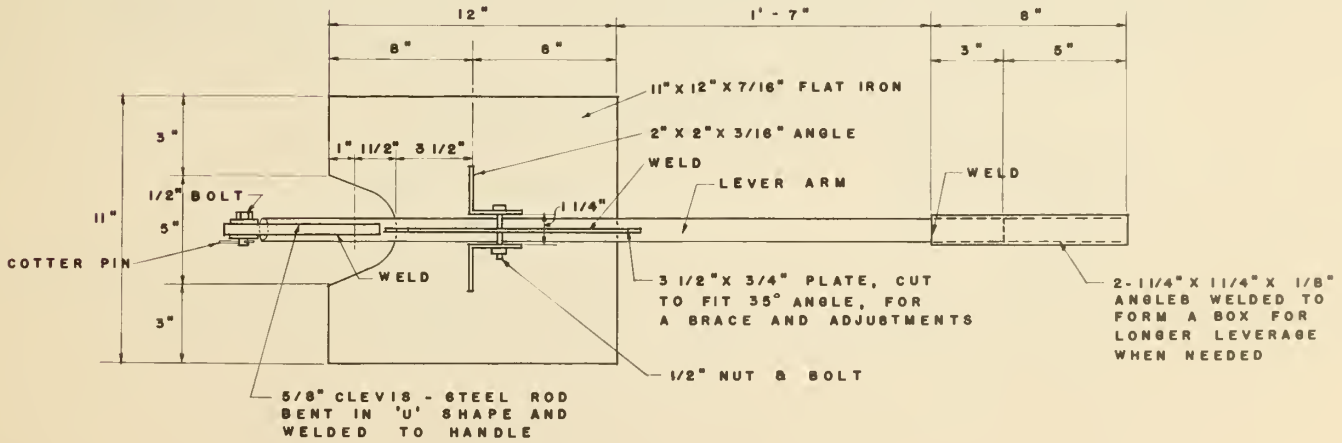
SIDE VIEW



FRONT VIEW

NOTE:

ALL WELDING TO BE DONE WITH AN A.O. MACHINE.



PLAN

HAY TURNER

SUGGESTED PROCEDURE

Drill rim of old cultivator wheel and bolt on side delivery rake teeth around rim at 3 inch intervals. Secure a piece of shaft of proper diameter for the wheel and 1 foot long.

Construct frame which bolts to front end of tractor. Note that the wheel support is on a hinge for up and down movement and on pins for changing the angle.

Push bar is made of two pieces of pipe which can be telescoped and locked in place with the adjusting crank to hold the wheel at the desired angle.

A cable is used to adjust the height of the wheel. The cable passes through two pulleys and back to the driver's seat where it can be attached to a lever.

BILL OF MATERIALS

3 1/2 ft. 2" x 2" x 1/4" angle
2 ft. 3" x 1/2" flat bar stock
1 ft. 2" x 1/2" flat bar stock
5 ft. 1 1/4" x 1/4" flat bar stock
1 ft. 1 1/4" shafting
8 ft. 1/2" rod
2 1/2 ft. 1" x 5/16" flat bar stock
4 ft. 1 1/4" pipe
1 1/2 ft. 1" pipe
2 pulleys
10 ft. 3/8" wire rope
1 - 30" diameter cultivator wheel
31 - side delivery rake teeth.
Bolts, welding rod

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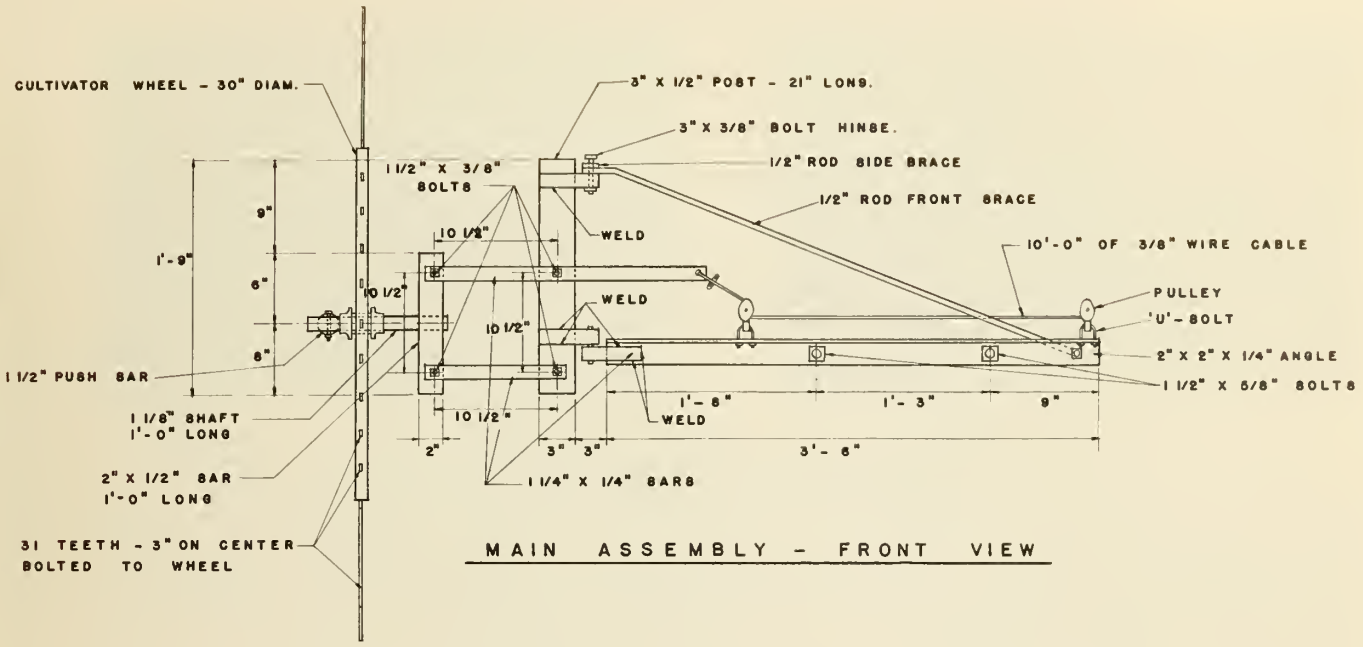
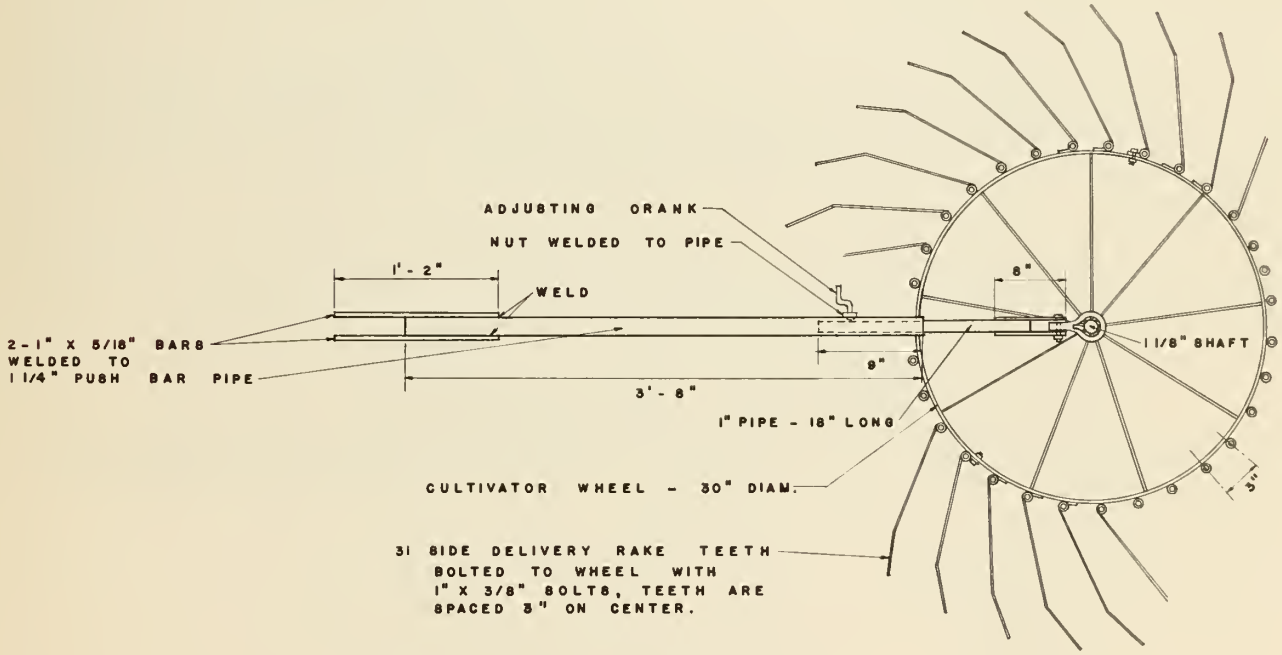


MAIN ASSEMBLY - FRONT VIEW


ADJUSTING CRANK
NUT WELDED TO PIPE
1'-2"
WELD
8"
2-1" X 5/16" BARS WELDED TO 1 1/4" PUSH BAR PIPE
1 1/8" SHAFT
9"
3'-8"
1" PIPE - 18" LONG
CULTIVATOR WHEEL - 30" DIAM.
31 SIDE DELIVERY RAKE TEETH BOLTED TO WHEEL WITH 1" X 3/8" BOLTS, TEETH ARE SPACED 3" ON CENTER.

PUSH BAR AND WHEEL - SIDE VIEW

TRACTOR MOUNTED WEED SPRAYER

SUGGESTED PROCEDURE

Assemble the pipe and fittings for the sprayer boom according to the plan. Drill the pipe--11/32" holes at 18" intervals--and tap 1/8" pipe threads for purchased spray nozzles. Note how end sections are made flexible with tees, joined by pieces of high pressure hose, and with nipples and caps forced into the ends of mower springs.

Cut and assemble the frame to support the boom. Dimensions may vary some from the plan according to the model of tractor. Boom should extend about 18" in front of tractor. U-bolts hold boom to angle support which is fastened to main frame with bolts to allow height adjustment. Pulleys welded to ends of upper frame cross member are for ropes to permit raising boom ends from tractor seat.

Power take-off driven commercial pump is fastened on angle iron bracket at rear of tractor and connected by hose to boom. A 30 or 55 gallon drum mounted on tractor drawbar serves as spray reservoir.

BILL OF MATERIALS

21' - 3/4" Pipe
6 - 3/4" Caps
5 - 3/4" Tees
4 - 3/4" x 2" Nipples
4 - 3/4" x 3/8" Bushings
1 - 3/4" x 1/2" Bushing
4 - 3/8" x 3" Nipples
1 - 1" x 3/4" Bushing
1 - 1" x 1/2" Bushing
1 - Power take-off adapter
1 - Line strainer
1-Pressure gauge-0-100 lbs.
1 - Brass shut-off valve

1-Bronze gear pump with stainless steel shaft and pressure regulator-delivers 5.2 gpm. at 600 rpm.
14 - Tee-jet nozzles
12 ft. - 1/2" Oil proof hose
4 - Hose to pipe adapters
40" - 1/2" high pressure hose
2 - 12" x 2" mower springs
10 - 1 1/4" x 1 1/4" x 1/4" Angle
21'4" - 2 x 2 x 1/4" angle
(Additional Angle needed for pump and barrel mounts)
2 - Pulleys, Bolts, U-Bolts, etc.

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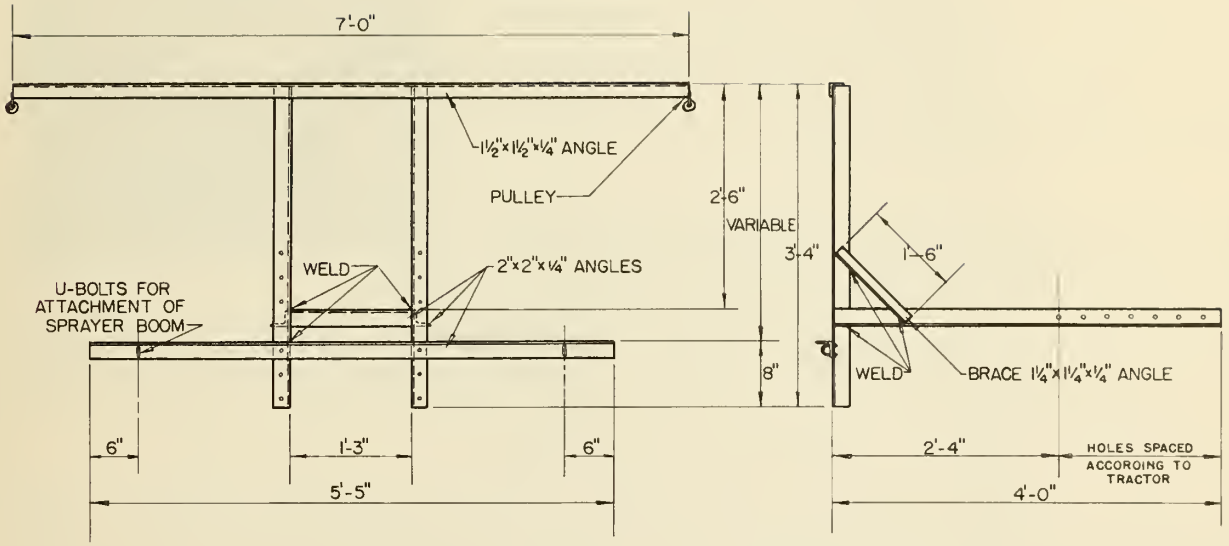
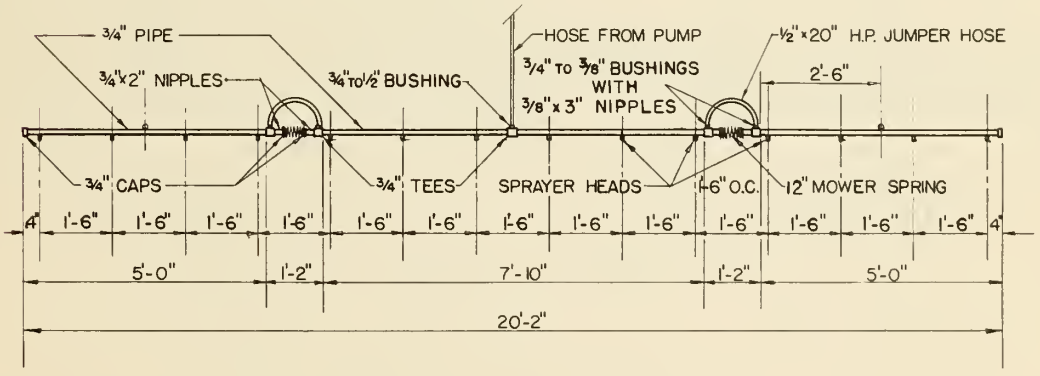


FRONT VIEW

SIDE VIEW

SPRAYER MOUNT



SPRAYER BOOM DETAIL

TRAILER TYPE WEED SPRAYER

SUGGESTED PROCEDURE

Cut car front axle and weld in section to extend width to 6 feet. Cut pieces of angle iron and weld together to make main frame. Weld in 2" pipe tongue and construct hitch for front end. Drill a series of holes in the upright frame pieces so that sprayer boom can be attached with U-bolts at various heights.

Assemble the pipe and fittings for the spray boom according to the plan. Drill 11/32" holes at 20" intervals in the pipe and tap to 1/8" pipe thread for purchased spray nozzles. Note how end sections are made flexible. The 3/4" tees are bushed down to 3/8" and 20" pieces of high pressure hose are clamped over short 3/8" nipples. Then 3/4" nipples with caps on them are forced into mower springs. Fasten the boom to the frame with U-bolts and attach the chains to support the end sections.

Mount two 55-gallon drums on the trailer frame and fasten them down with chains and eye bolts through the frame side pieces. Make filler pipes for the barrels with 2" nipples and elbows as shown in the photo. Connect the barrels at the bottoms with pipe and fittings and bring a common discharge pipe forward along the tongue. Mount another piece of pipe between the barrels, supported on uprights with U-bolts. This line contains the shut-off valve and pressure gauge and is connected to the spray boom at the rear end of the trailer with a piece of hose.

Mount a commercial power take-off driven spray pump on the tractor and connect it to the supply and discharge pipes with hose.

BILL OF MATERIALS

12 1/2 ft. - 2 1/2" x 2 1/2" x 3/16" angle
10 1/2 ft. - 2" x 2" x 1/4" angle
14 1/2 ft. - 1 1/2" x 1 1/2" x 1/4" angle
7 ft. - 2" pipe
6 ft. - 2" x 1/2" flat iron
34 ft. - 3/4" pipe
6 - 3/4" tees
4 - 3/4" x 2" nipples
2 - mower springs
Pressure gauge
14 - spray nozzles
Chain
5 - 3/4" x 6" nipples
6 - 3/4" caps
4 - 3/4" x 3/8" bushings
4 - 3/8 x 2" nipples
2 - 3/4" x 1/2" bushings
4 - 2" x 6" nipples
2 - 2" elbows
Car front end with wheels and tires
Shut-Off valve
Power take-off driven spray pump
High pressure hose
U-bolts

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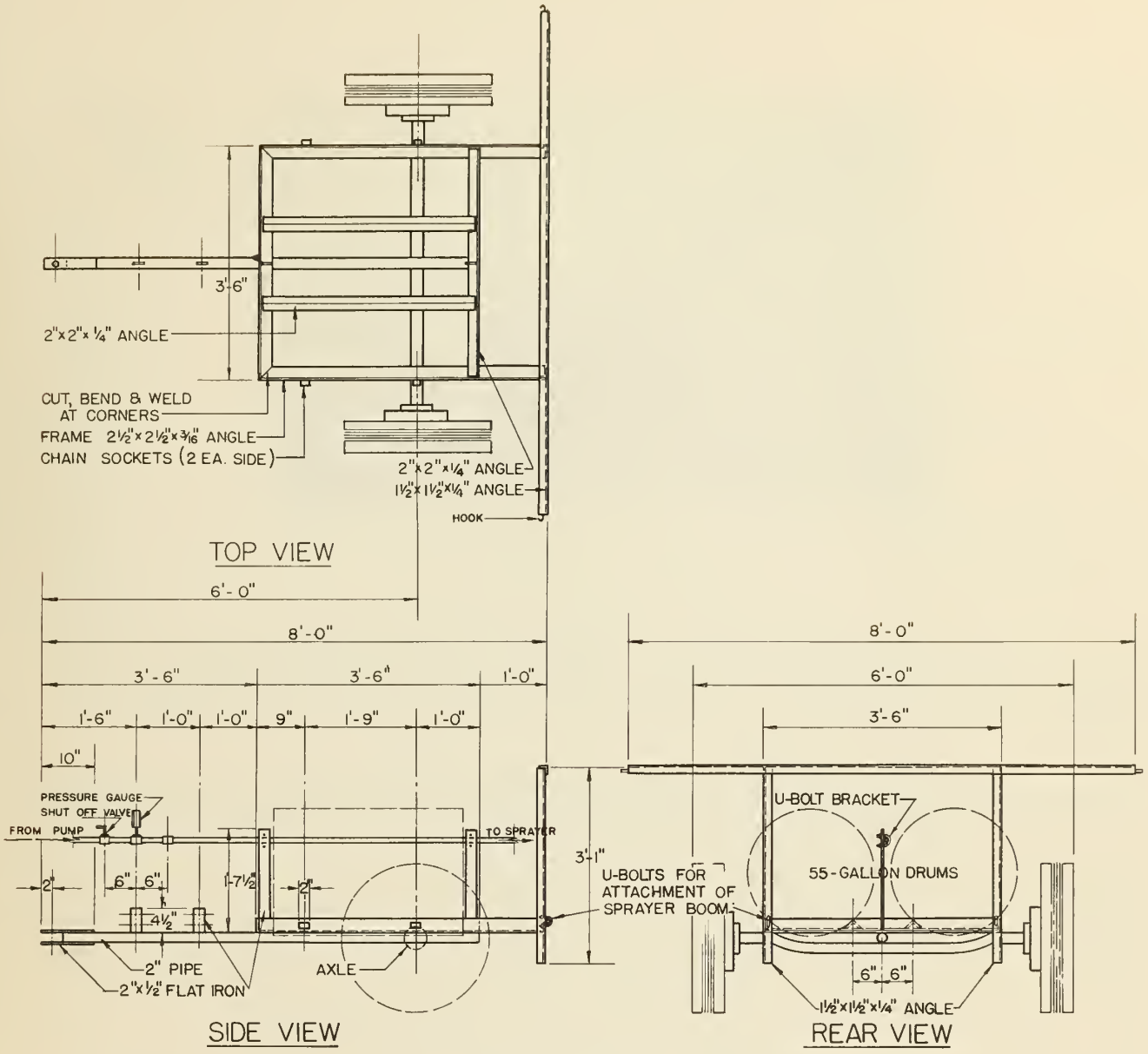
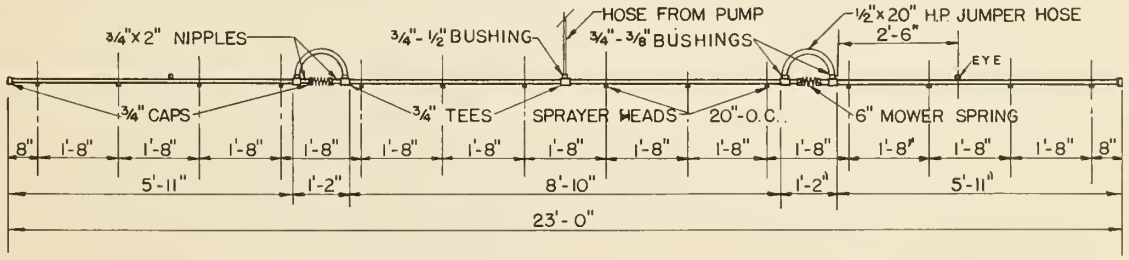


TRAILER DETAIL



SPRAYER BOOM DETAIL

POST HOLE DIGGER

SUGGESTED PROCEDURE

Build or buy the auger. For the original, the flights were purchased and welded to a piece of 1-1/4" pipe. Secure an auto differential, dismantle it and weld the ring gear solid. Cut down the axle housings and weld a plate over one end. Leave the other axle stub long enough to insert inside the auger pipe and drill holes through the pipe and axle for bolting them together.

The main frame is made of 1-1/2" pipes which are flattened and drilled at the lower ends to fasten on the tractor stabilizer brackets. The upper ends telescope inside 2" pipes which are fastened to the 1" shaft by a swivel connection as shown in the detail of the top view.

Construct the arch assembly and equalizer arms that keep the digger upright as it goes into the ground. Attach a universal drive to the differential and another one to the power take-off spline. Build the telescoping drive shaft out of 1-1/4" pipe. Cut two pieces of 1-1/4 x 1-1/4 x 3/16" angle iron 18" long and weld them together to form a square box. Weld this box onto the end of the 1-1/4" pipe. Fasten a piece of 1" square stock to the universal joint on the PTO and let it telescope inside the square box. The exact length of this 1" square piece will have to be determined after the digger is mounted.

The arch arms and the side brackets on the main frame pipes are fastened to the lower links of the tractor hitch with 7/8" bolts. The equalizer arm attaches to the upper tractor hitch link.

BILL OF MATERIALS

1 set - 9" auger flights, 3'6" long
15' - 1-1/4" pipe
18' - 1-1/2" pipe
4-1/2' - 2" pipe
1' - 1" pipe
3' - 1-1/4" x 1-1/4" x 3/16" angle iron
4' - 1" square stock
13-1/2' - 1" x 1/4" flat stock
1 auto differential
1 universal joint to fit differential
1 universal joint to fit PTO
2 - 7/8" x 6" machine bolts
2 - 1/2" x 1" machine bolts
2 - 3/8" x 1-1/2" machine bolts
2 - 3/8" x 2" machine bolts
4 - cotter keys

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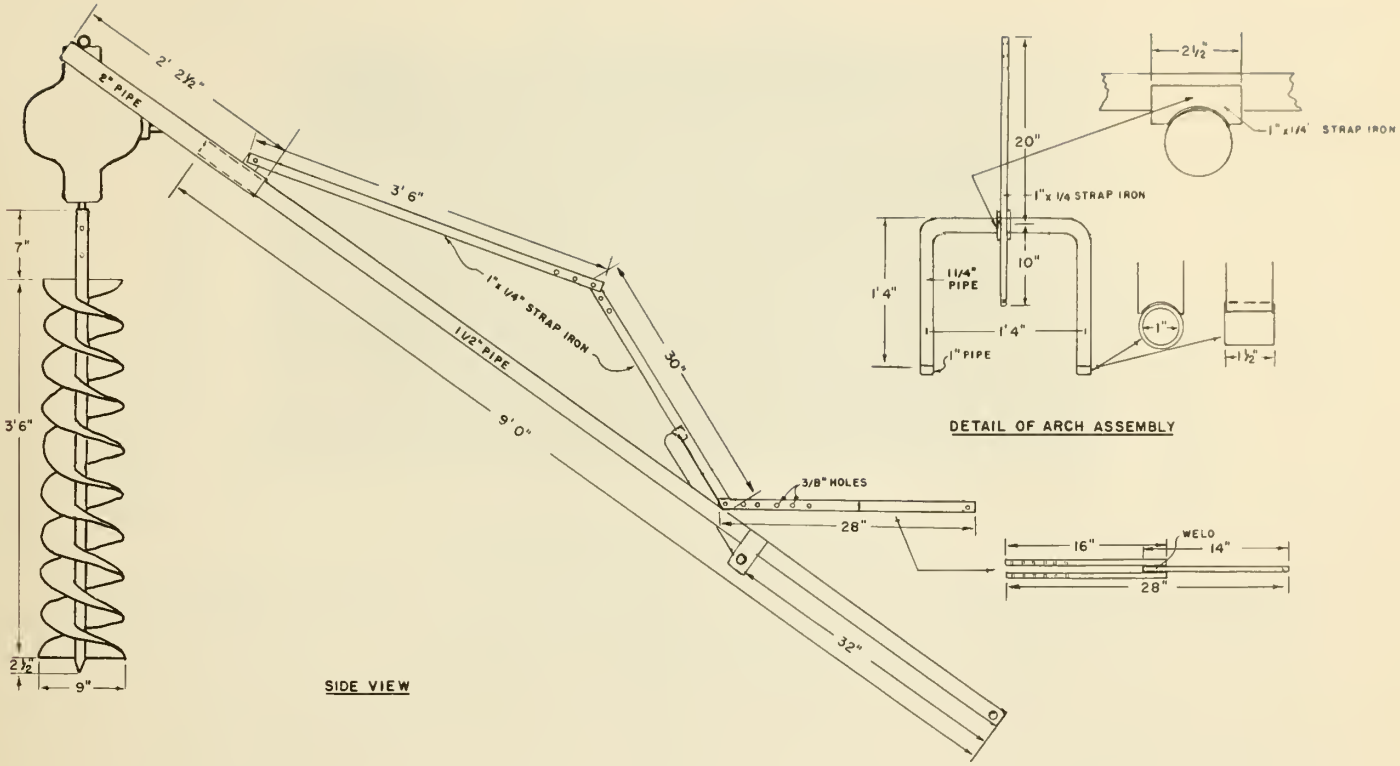
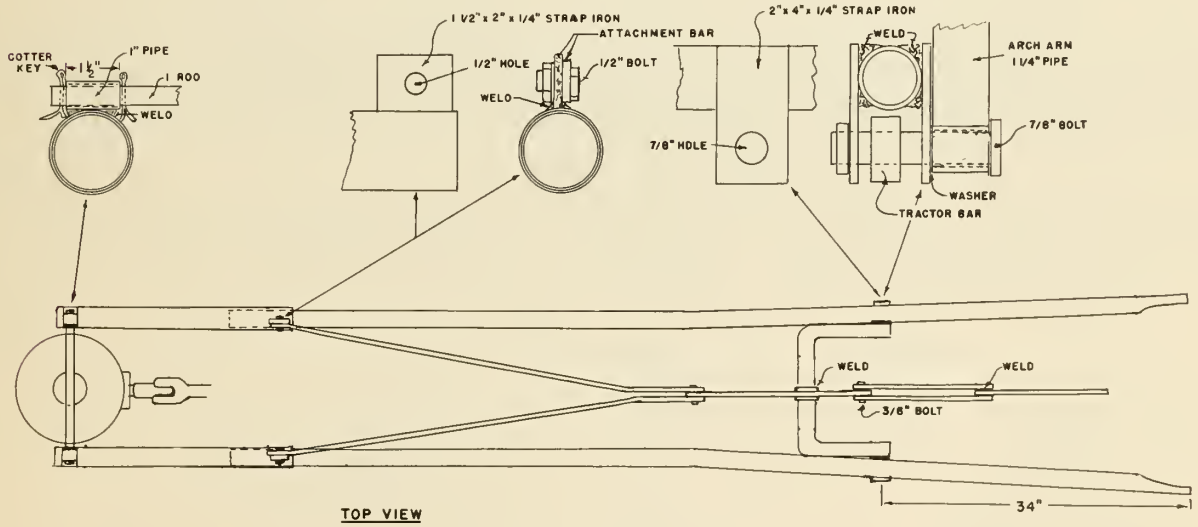
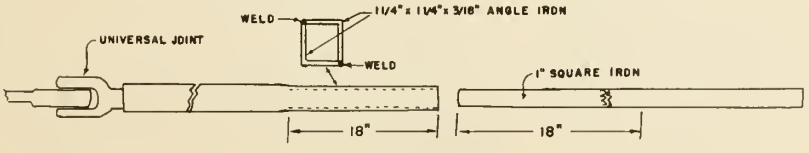

2' 2½"
2" PIPE
3' 6"
1" x 1/4" STRAP IRON
1½" PIPE
9' 0"
30"
32"
7"
3'6"
2½"
9"
3/8" HOLES
28"
16"
14"
WELD
28"
SIDE VIEW
2½"
1" x 1/4" STRAP IRON
20"
1" x 1/4 STRAP IRON
1¼" PIPE
10"
1'4"
1'4"
1" PIPE
1"
1½"
DETAIL OF ARCH ASSEMBLY


COTTER KEY
1½"
1" PIPE
1 ROD
WELD
1 1/2" x 2" x 1/4" STRAP IRON
ATTACHMENT BAR
1/2" HOLE
1/2" BOLT
WELD
2" x 4" x 1/4" STRAP IRON
7/8" HOLE
WELD
ARCH ARM
1¼" PIPE
7/8" BOLT
WASHER
TRACTOR BAR
WELD
WELD
3/8" BOLT
34"
TOP VIEW


WELD
1¼" x 1¼" x 3/16" ANGLE IRON
UNIVERSAL JOINT
WELD
1" SQUARE IRON
18"
18"
TELESCOPING DRIVE TO P.T.O.

FIELD CULTIVATOR

SUGGESTED PROCEDURE

Frame is made of two 3" channels welded together to make a square tube. Tongue and braces are 3" I-beams welded to the frame. Hitch is made to provide a wide range of vertical adjustment as shown.

Spring teeth are bolted to 2" channel brackets which are welded to the frame 23 inches apart.

Auto front wheels are provided to carry the cultivator in transport and to regulate depth of operation in the field. Wheel arms are welded to the spindles and to a cross shaft which is held in boxings fastened to the front frame. One of each pair of boxings is welded on and the other bolted to permit removing the wheel assembly if necessary.

Levers and sectors are constructed and attached to wheel arms to provide adjustment in height. Sectors are bent first and then a series of 1/2" holes are drilled around the outer edge. These are sawed out to form notches for the lever latch to engage.

BILL OF MATERIALS

64 ft. - 3" channel
22 ft. - 3" I-beam
6 ft. - 2" channel
2 ft. - 1 1/4" shafting
4 - 1 1/4" shaft boxings
2 pieces - 3" x 6" x 1" iron for spindle blocks
2 pieces - 3" x 5/8" x 2' iron for wheel arms
2 pieces - 3" x 1/2" x 2' iron for sector braces
2 pieces - 2" x 1/2" x 3' iron for sectors
2 pieces - 2" x 3/8" x 4' iron for levers
2 pieces 2" x 1/2" x 1'6" iron for connecting arms
2 pieces 12" x 1/2" x 1' iron for hitch plates
1 piece 2" x 1/2" x 1'6" iron for hitch clevise
5 ft. - 1/2" rod for lever latches
Bolts, springs, hitch pin, etc.
2 auto wheels with tires and spindles

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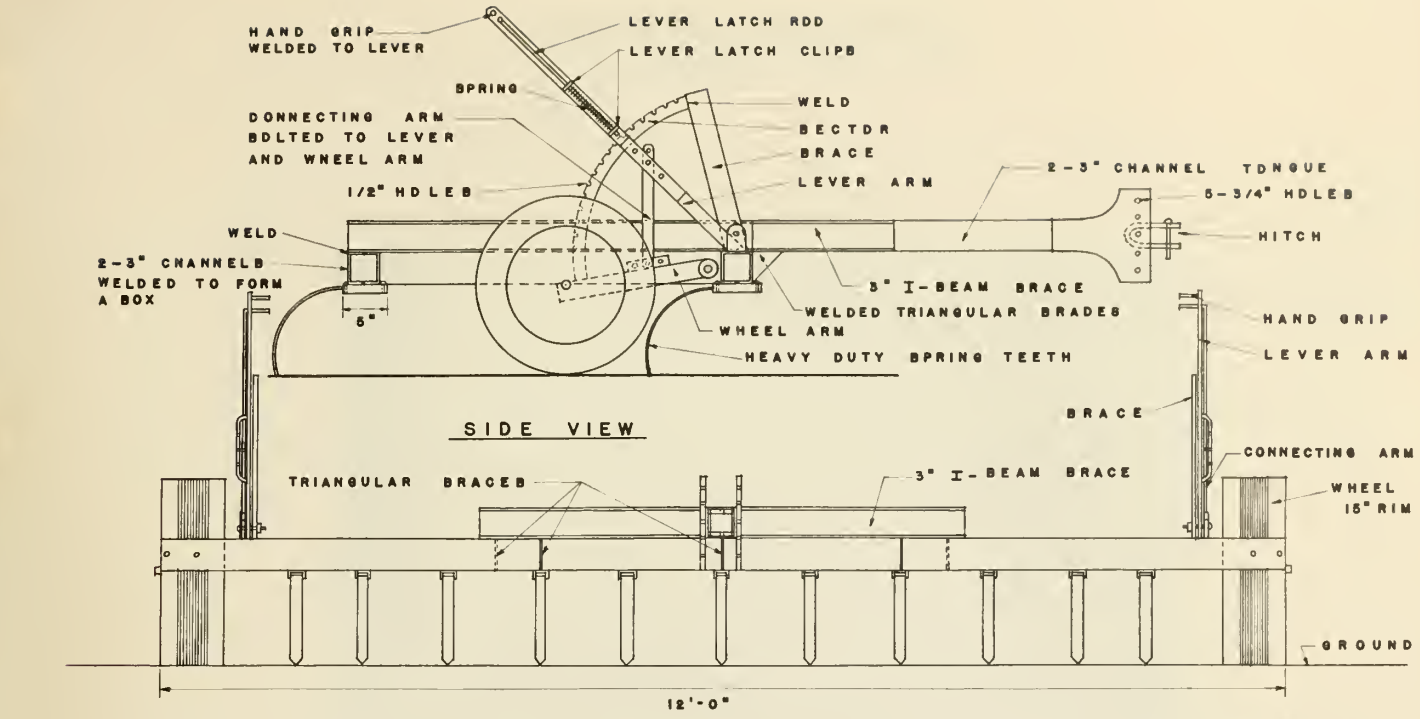
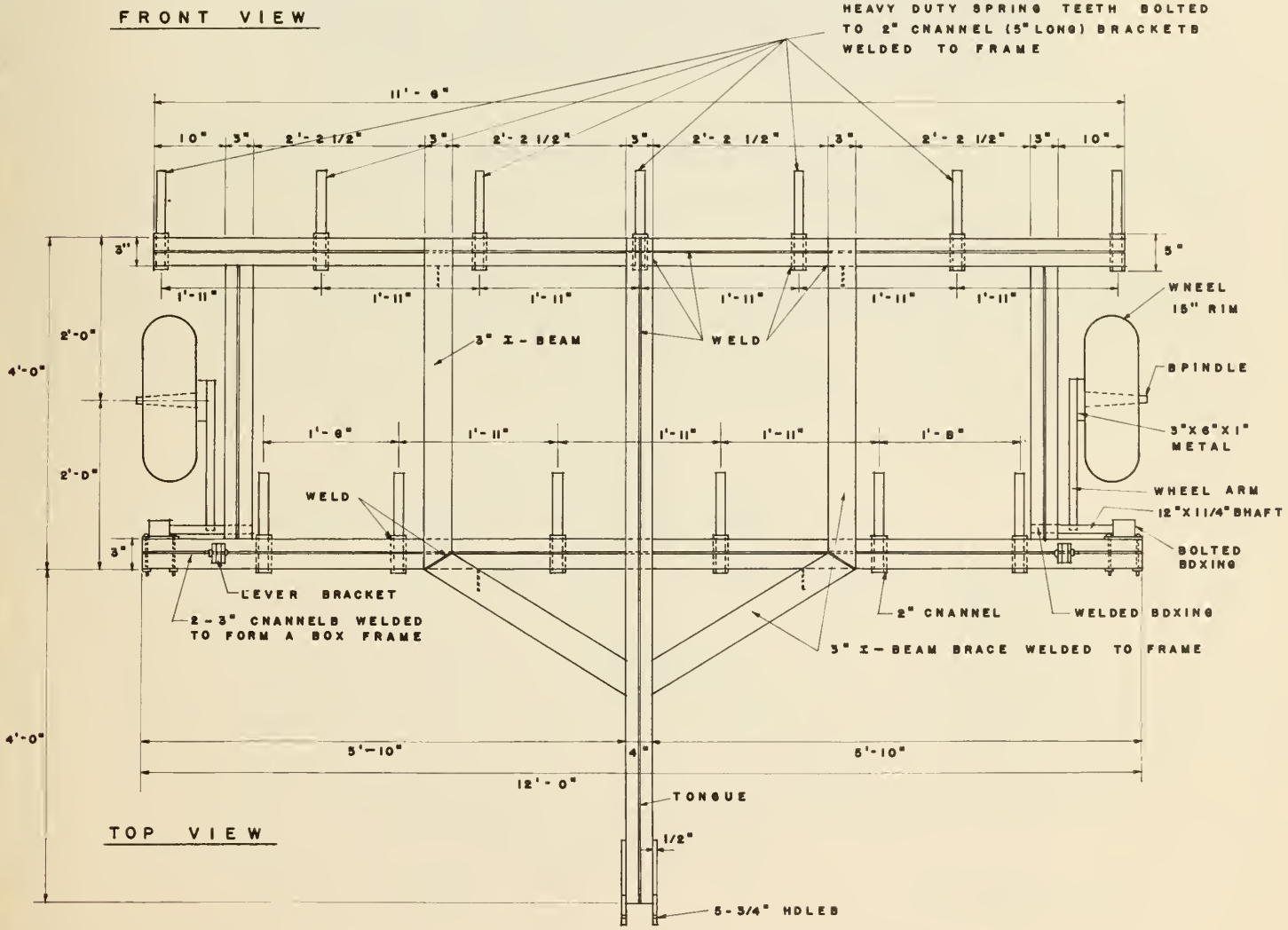


FRONT VIEW



TOP VIEW

SPRINGTOOTH

SUGGESTED PROCEDURE

This springtooth is made to fit on a Ford or Ferguson tractor. The frame is made of 2" x 3" x 1/4" angle which is cut and bent as shown in the frame plan.

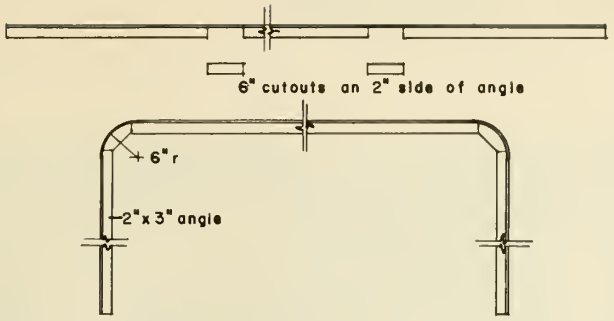
The spring teeth are bolted at the intervals indicated to the two 1 1/2" pipe crosspieces. Short pieces of 1 1/2" shafting are fitted into the ends of the pipes and bolted in place. 1 1/2" holes are cut in the frame angles to hold the 1 1/2" shafts and 2 1/2" rings are welded onto the shafts to hold the pipes securely, yet to permit them to be rotated as the angle of the teeth is adjusted

Method of adjusting teeth is shown in tooth adjustment detail.

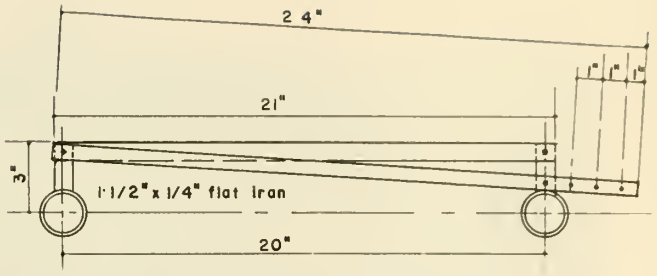
BILL OF MATERIALS

13 ft. - 2" x 3" x 1/4" angle
24 ft. - 2" x 3/8" flat iron
14 ft. - 1 1/2" pipe
1 ft. - 1 1/2" shafting
1 ft. - 3/4" rod
2 - 1/4" x 2 1/2" rings
13 Spring Teeth
Bolts
Welding Electrode

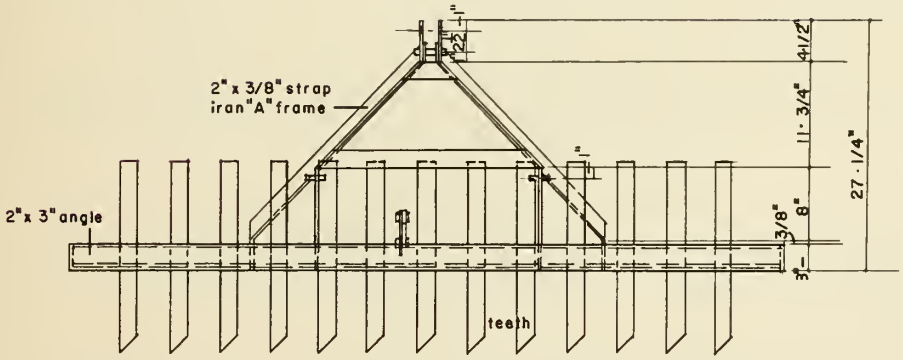
* * * * *



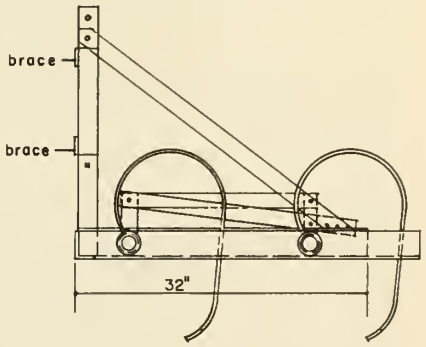
FRAME PLAN



TOOTH ADJUSTMENT SIDE VIEW

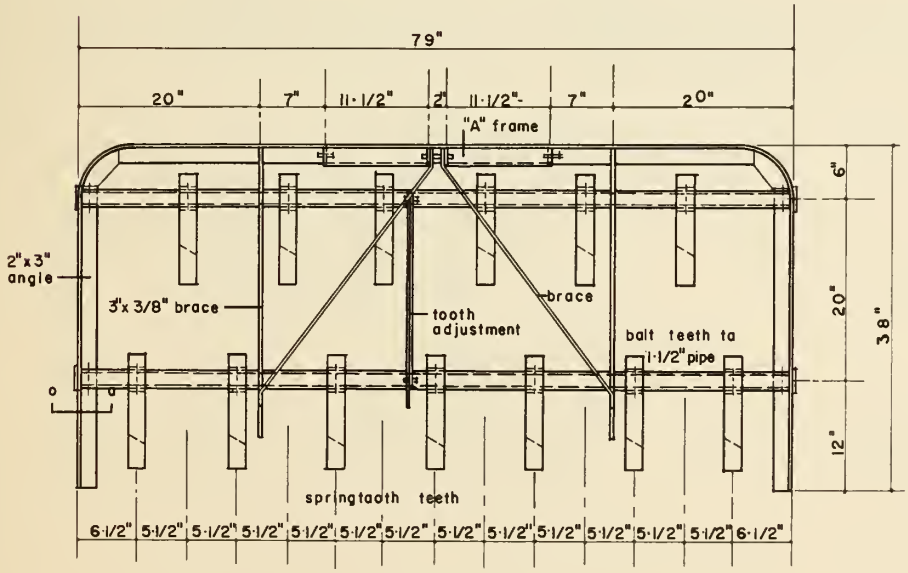


FRONT VIEW

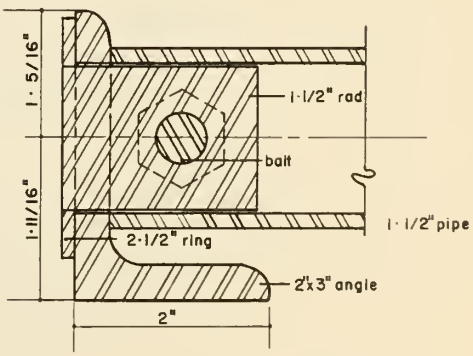


Nate – Unless atherwise nated all jaints welded.

SIDE VIEW

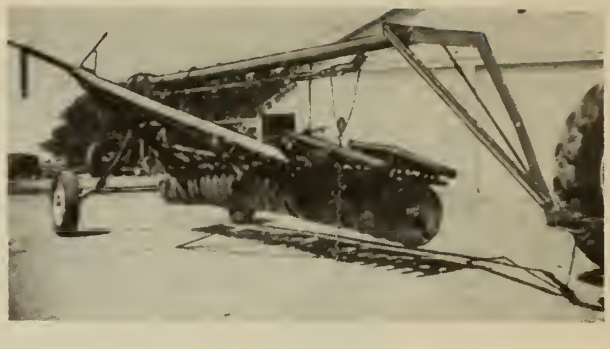


PLAN



SECTION A-A

IMPLEMENT CARRIER



SUGGESTED PROCEDURE

Secure auto front end, cut axle, and weld in a piece of 1" shaft to extend the width of tread to 7', inside to inside.

Build up the rear support and attach the 4" pipe hoist beam. Also weld on the front support and hitch for attaching the carrier to the tractor drawbar. Bend and weld the cable brackets onto the 4" pipe. Stiffen the hoist beam with a 5/8" truss rod.

Mount the 1 1/2" pipe hoist reel with 5 bearing supports suspended from the hoist beam. Combine reel bearings were used on the original. They could be made from short sections of 2" pipe. Secure a large wheel and weld it onto the rear end of the hoist reel.

Build the ratchet device with the knee release lever as shown. This enables the operator to use both hands on the wheel when lowering an implement. The ratchet will operate automatically when an implement is being raised.

Attach the cables, pulleys and short pieces of chain. Use regular cable clamps to secure the ends of the cables after they are looped through the brackets on the hoist beam and the hoist reel.

BILL OF MATERIALS

16 ft. - 4" pipe
14 ft. - 1 1/2" pipe
37 ft. - 1 1/2" x 1 1/2" x 1/4" angle
6 ft. - 4" x 3/4" flat stock
2 ft. - 3" x 1/2" flat stock
15 ft. - 5/8" rod
6 ft. - 1/2" rod
3 1/2 ft. - 1" x 1/2" flat bar
1 piece-1/2" plate, 8" square for ratchet
1" - expansion spring
4 ft. - 1" shafting
5 combine reel bearings, or equiv.
5 reel arm frogs or equivalent
6 - 3" single block pulleys
60 ft. - 1/4" to 3/8" cable
18 ft. chain
6 chain hooks
12 cable clamps
Grader handwheel, or equivalent
Auto front end with wheels and tires.

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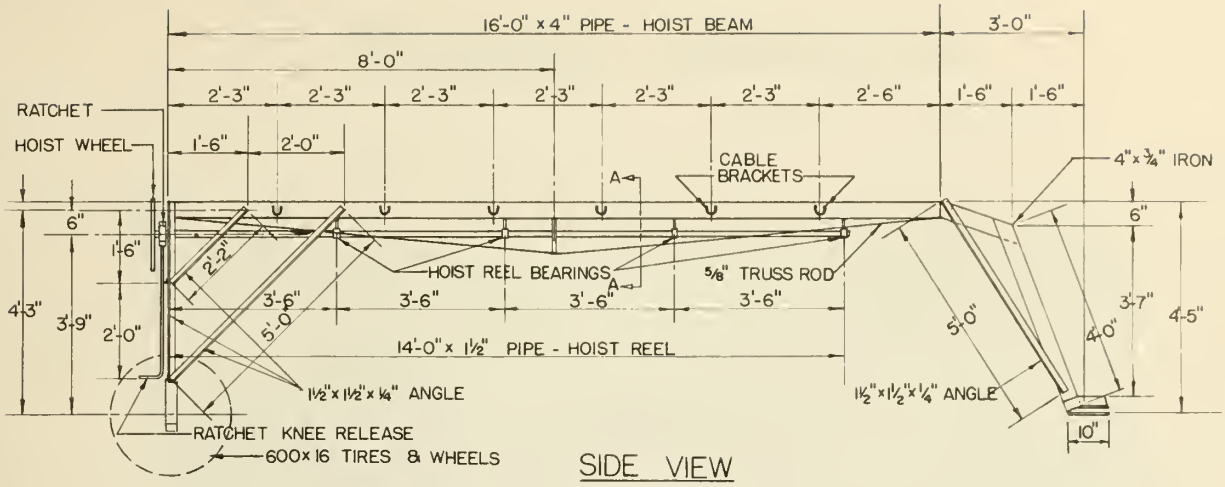
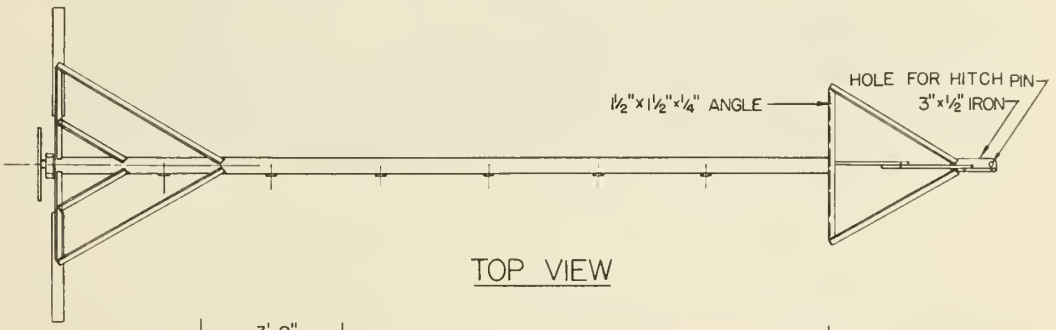
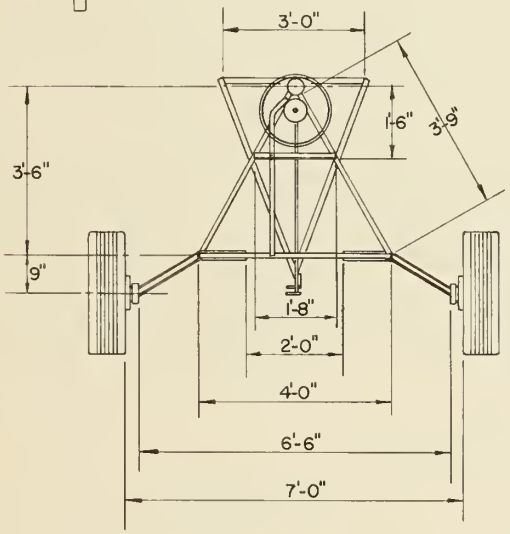


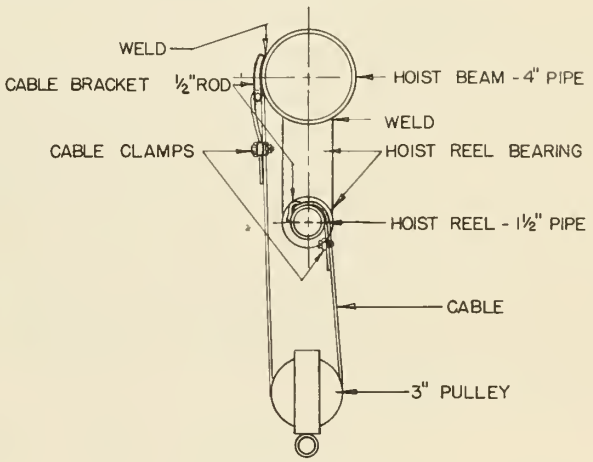
SIDE VIEW



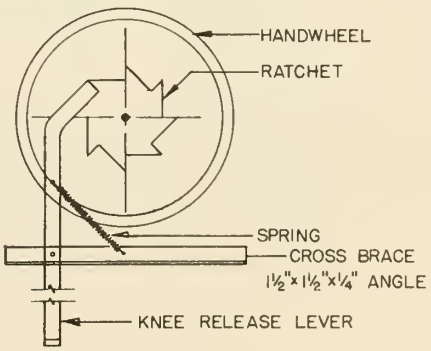
TOP VIEW



REAR VIEW

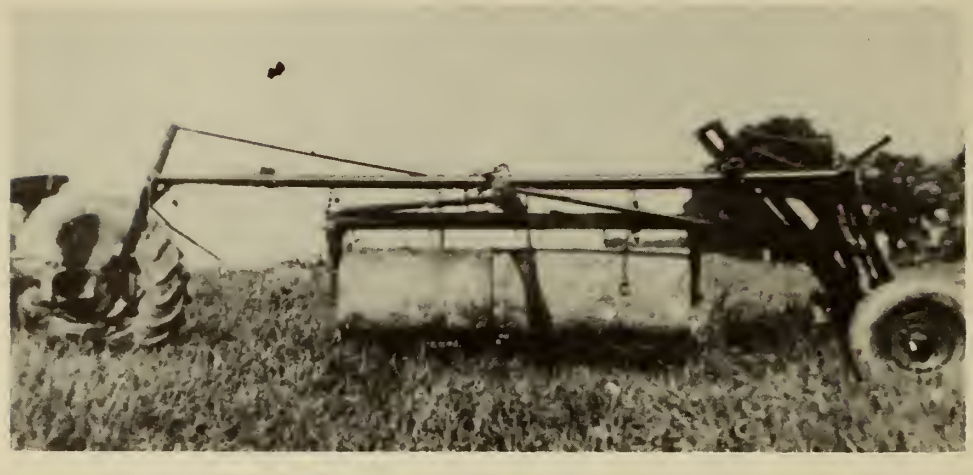


SECTION A-A



RATCHET DETAIL

IMPLEMENT CARRIER



SUGGESTED PROCEDURE

Cut pieces and weld together as indicated. All joints should pivot freely. Adjust length of 1 1/4" pipe and spacing of wooden stop blocks and notches (see brace detail) to provide a lift of one foot or more.

To use carrier, pull behind implement to be moved and back tractor around until carrier is directly over the implement. Pull rope which lets holding stake down. Then back up and pull the rope which unlatches the two notched braces holding up the carrier. Let tractor run forward to lower carrier. Attach chains to implement and fasten to adjustable angle crosspieces of carrier. Back up the tractor causing the implement to be raised clear of the ground. When the notched braces latch, pull ahead to release holding stake. Then pull it up clear and go.

BILL OF MATERIALS

Axle with wheels and rubber tires
24 ft. - 2 1/2" pipe
18 ft. - 2" pipe
4 ft. - 1 1/2" pipe
16 ft. - 1 1/4" pipe
10 ft. - 2 1/2" x 1 1/2" x 1/4" angle
20 ft. - 2" x 2" x 1/4" angle
2 ft. - 1 1/2" x 1 1/2" x 1/4" angle
1 ft. - 1 1/4" x 1 1/4" x 1/4" angle
8 ft. - 2" x 1/2" flat iron
4 ft. - 1 1/2" x 1/2" flat iron
3 ft. - 1 1/2" x 3/8" flat iron
3 ft. - 1 1/2" x 1/4" flat iron
1 ft. - 1" shafting
8 ft. - 3/4" shafting
40 ft. - 1/2" rope
1 pulley
Bolts
Welding Electrode

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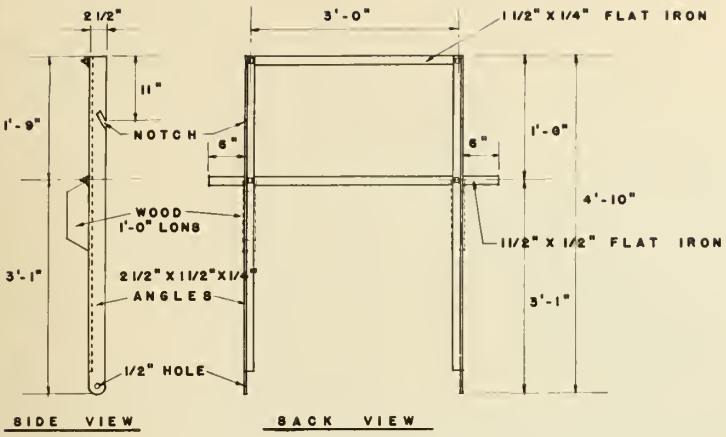
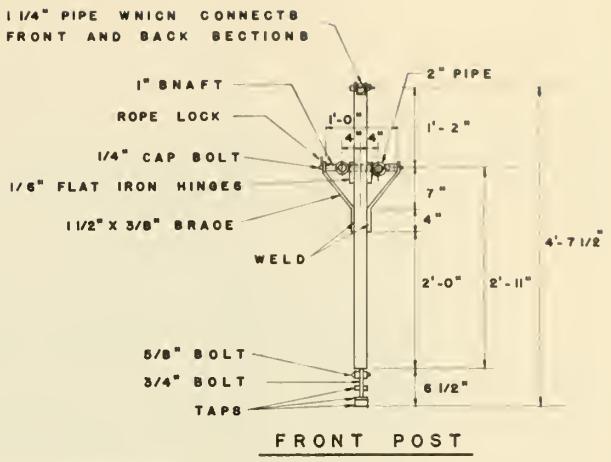
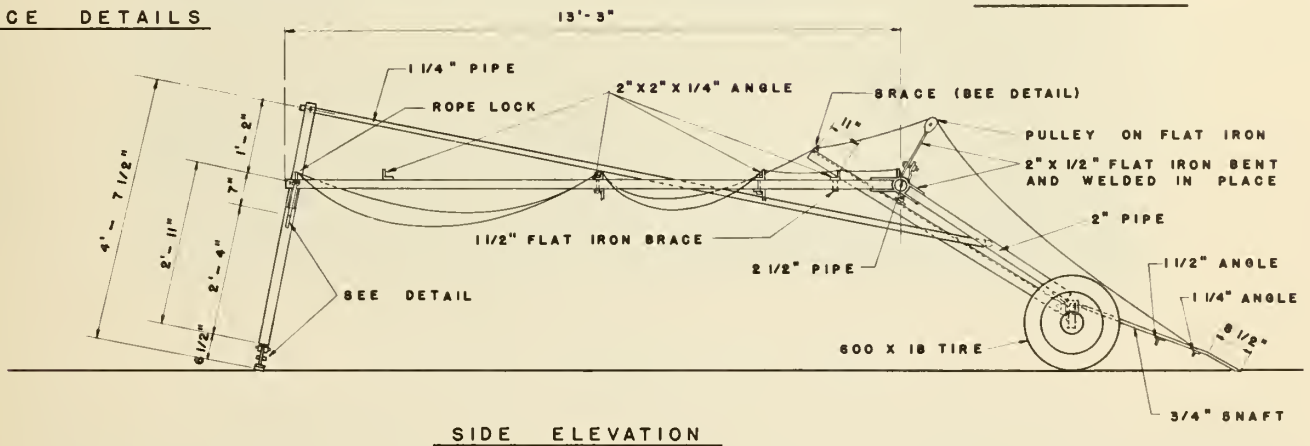


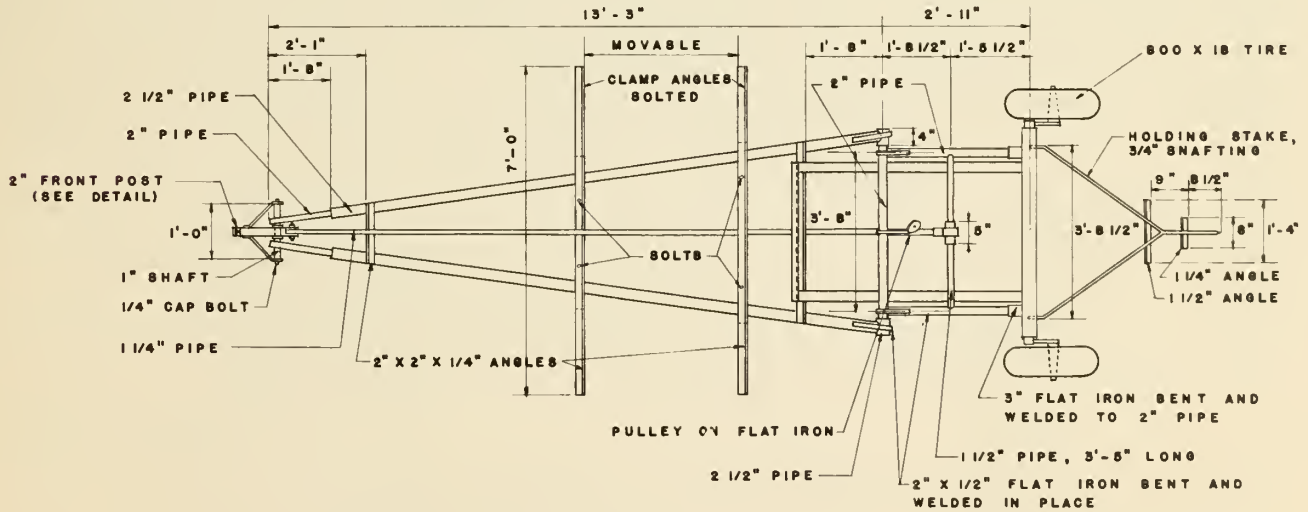
BRACE DETAILS



FRONT POST

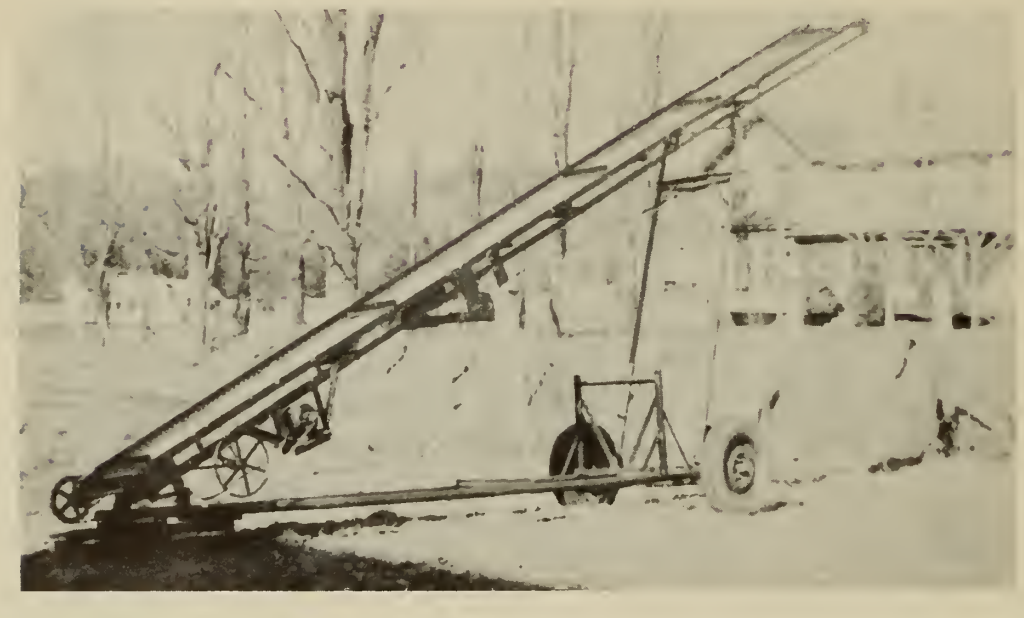


SIDE ELEVATION



FRONT END TOP VIEW BACK END

BALED HAY CONVEYOR



SUGGESTED PROCEDURE

Cut angle iron and flat iron braces for conveyor and weld together.

Cut angle iron and flat iron braces and weld together to make conveyor frame. The 14 gauge sheet metal bottom is fastened in place with flat-head bolts countersunk to make a smooth surface for the bales to slide on.

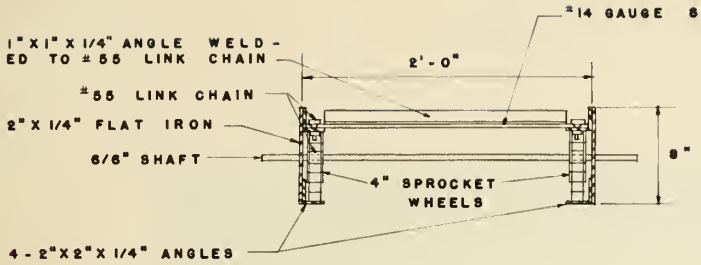
Hangers for the sprocket shafts at each end, and for the motor, jackshaft, and winch are also welded in place.

Carrier frame is welded together and to old car front axle which has spindles welded solid.

BILL OF MATERIALS

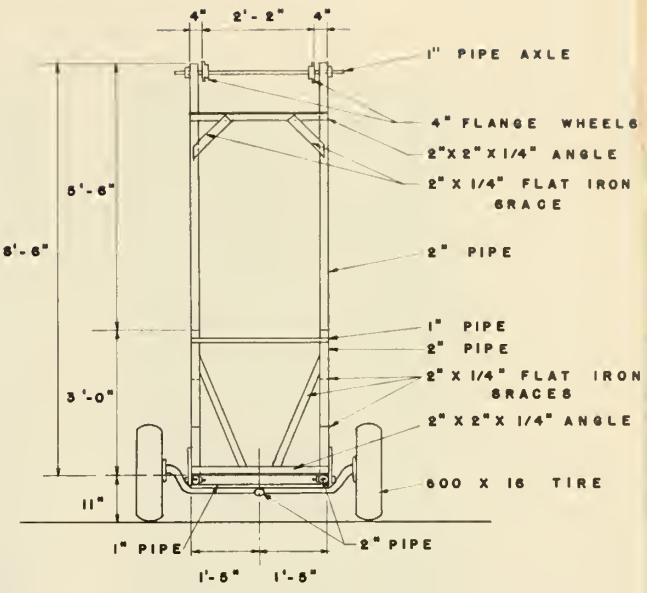
66 ft. - 2" pipe
20 ft. - 1" pipe
130 ft. - 2" x 2" x 1/4" angle
26 ft. - 1" x 1" x 1/4" angle
50 ft. - 2" x 1/4" flat iron
Front axle of car with wheels and tires
8 ft. - 5/8" shafting
6 - 5/8" bearings
50 sq. ft. - #14 gauge steel
2 - 4" flanged wheels
5 - 4" sprockets
1 - 8" sprocket
110 ft. - #55 chain
1 - 2" V-pulley
1 - 14" V-pulley
1 - 72" V-belt
1 - hand winch
15ft. - 3/8" cable
1 - 1/2 h.p. electric motor
Bolts
Welding electrode

* * * * *

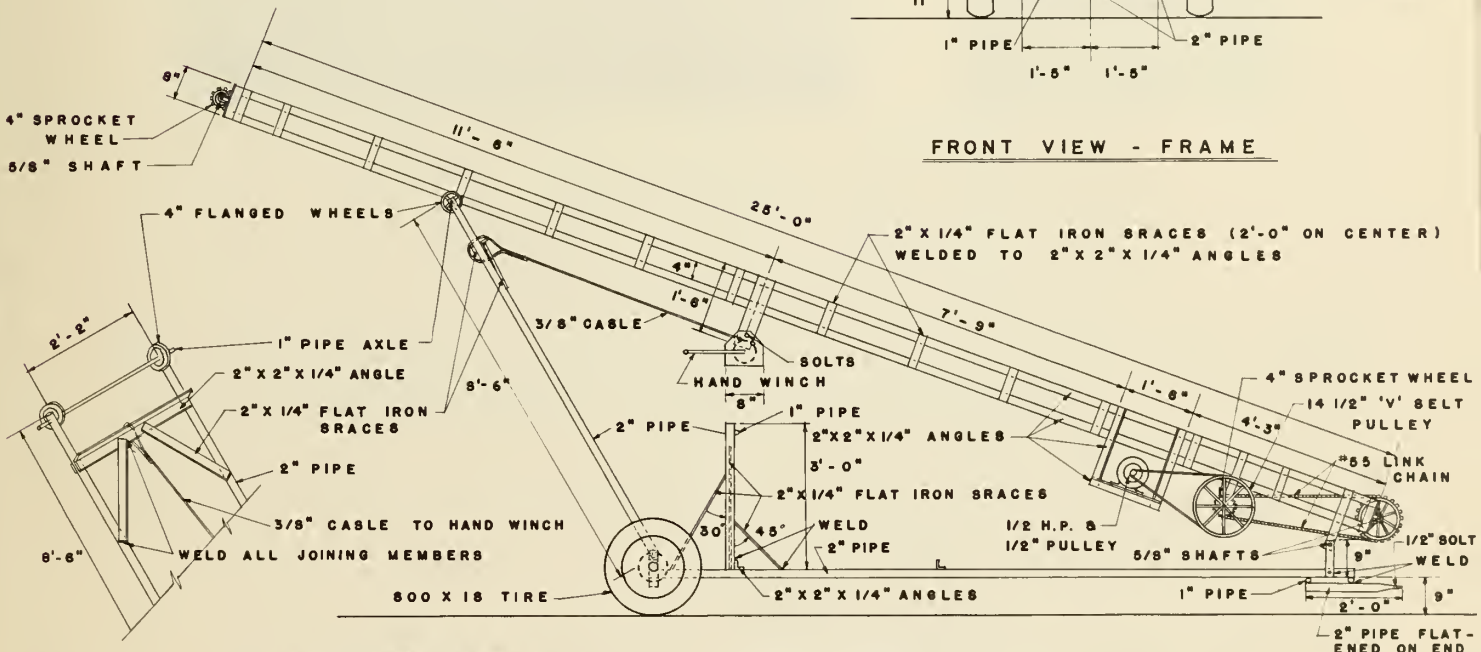

#14 GAUGE SHEET METAL
1" X 1" X 1/4" ANGLE WELDED TO #55 LINK CHAIN
2'-0"
#55 LINK CHAIN
2" X 1/4" FLAT IRON
6/6" SHAFT
4" SPROCKET WHEELS
8"
4 - 2" X 2" X 1/4" ANGLES

SECTION 'A-A'

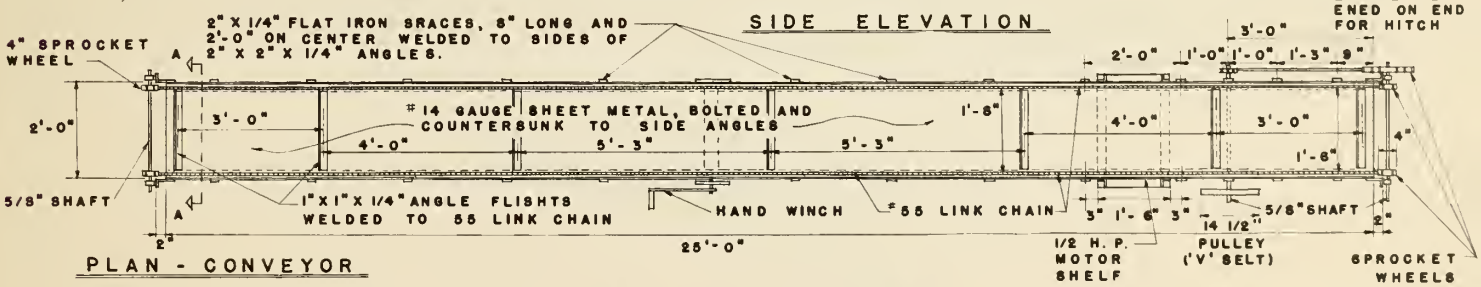
(SECTION THROUGH CONVEYOR)



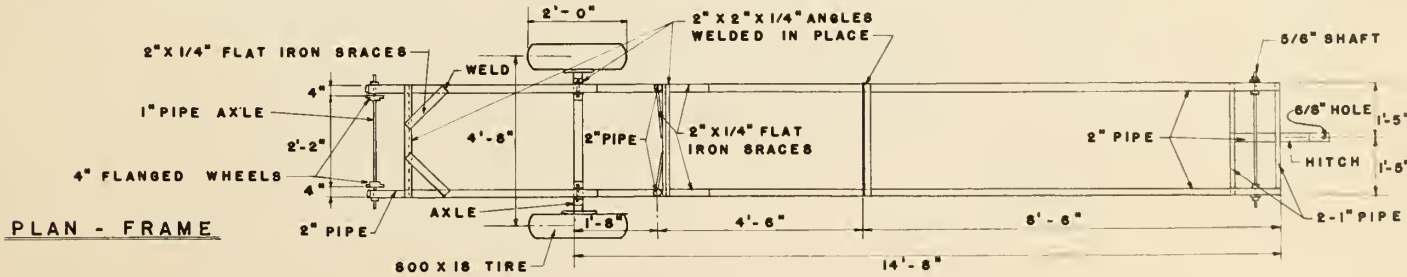
FRONT VIEW - FRAME



SIDE ELEVATION



PLAN - CONVEYOR



PLAN - FRAME

SHEEP HOLDER

SUGGESTED PROCEDURE

The 1/2" rod is pointed, bent, and welded together to make the three-point support which will be pushed into the ground when the holder is used. The 1 1/4" pipe is cut to length and a 1/2" hole drilled about an inch from one end. Over this hole a 1/2" nut is welded to take the set screw. This pipe is then welded to the three-point support.

The 1" pipe is cut to length and the flat iron is bent and welded to it. Slots are cut in the ends of the flat iron to hold the strap. The 1" pipe is then placed inside the end of the 1 1/4" pipe.

To make adjustment more convenient, a short piece of chain is fastened to a ring large enough to slip over the 1" pipe and a wrench of proper size to fit the set screw is welded to the chain.

BILL OF MATERIALS

1 ft. - 1 1/2" x 1/4" flat iron
1 ft. 4 in. - 1" pipe
1 ft. - 1 1/4" pipe
1 - 1/2" nut
1 - 1/2" set screw
3 1/2 ft. - 1/2" rod
Ring, chain and wrench
1" leather strap with buckle, 2 ft. long

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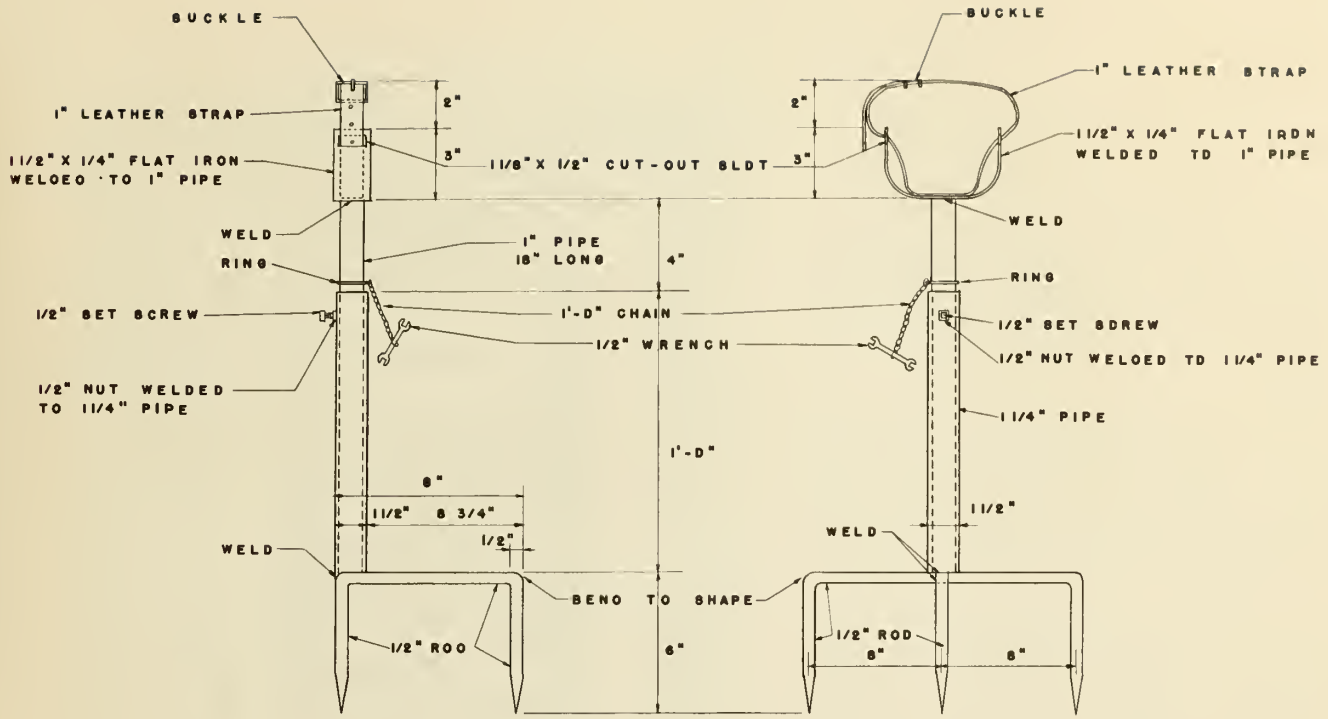
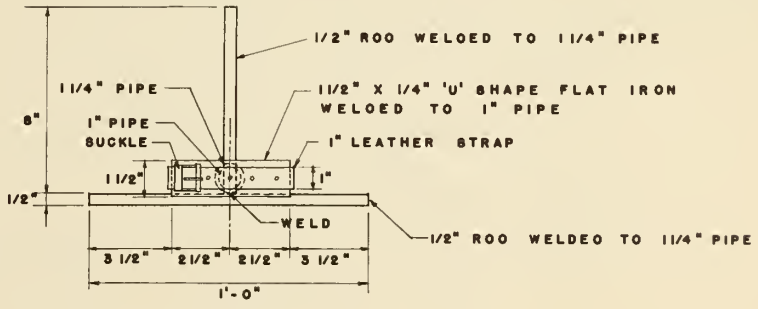


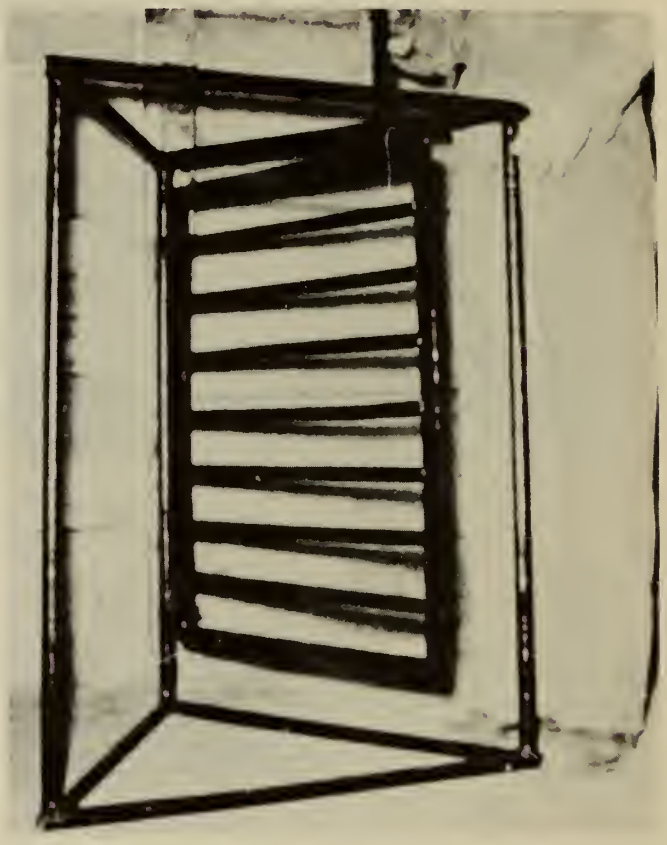
SIDE VIEW

FRONT VIEW



PLAN

SHEEP CUTTING GATE



SUGGESTED PROCEDURE

Cut six pieces of 1" pipe, 2' 6" long, making 60 degree angle cuts at each end. Weld these together to make two triangles which will form the top and bottom frame pieces.

Cut and weld the three upright frame members which join the corners of the two triangles. Drill the rear upright member, make and install the 3/8" hinge pins.

Cut the pieces for the gate frame from 1" x 1/4" flat stock, using 45 degree miter corners. Weld the gate together, using 3/8" rods or similar stock to fill in the opening. Old wheel spokes were used on the original.

Weld a flat iron handle on the top of the gate. This also serves as a stop to hold the gate in either position in use. Complete by welding on two short pieces of 1" x 1/4" stock with 3/8" holes drilled in them to complete the hinge assembly.

BILL OF MATERIALS

24 ft. - 1" pipe
9 1/2 ft. - 1" x 1/4" flat iron
6 in. - 1 1/2" x 1/4" flat iron
15 ft. - 3/8" rod
4 - 3/8" nuts

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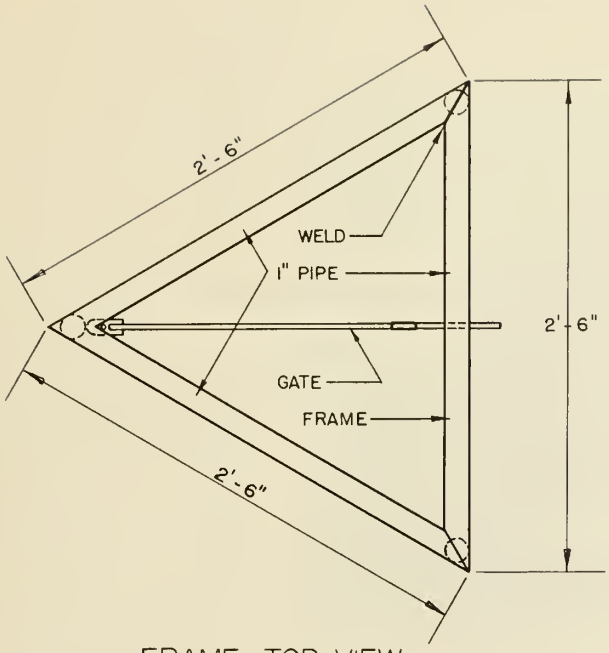
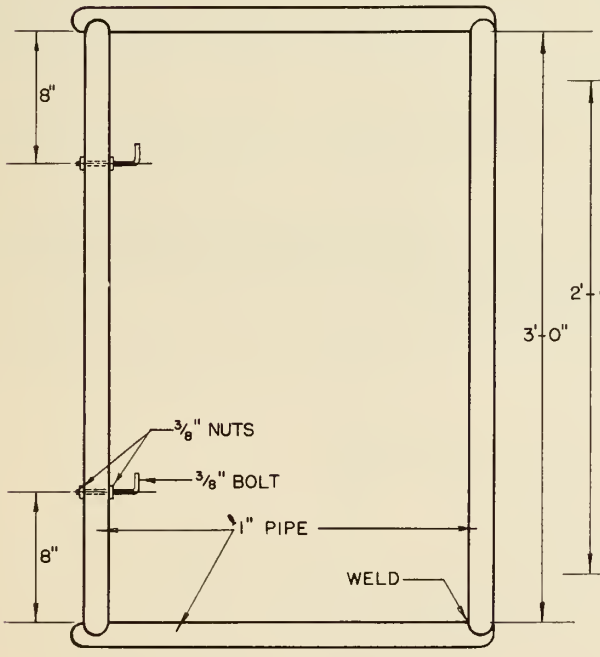
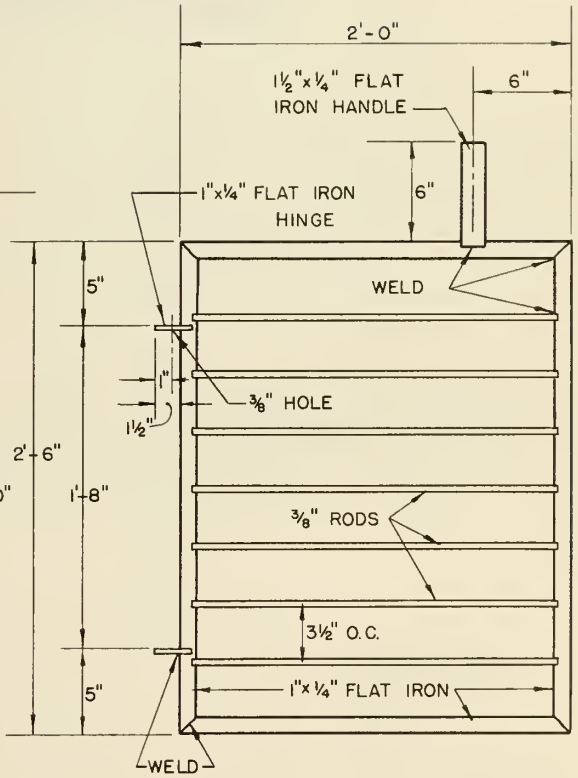


FRAME - TOP VIEW



FRAME-SIDE VIEW



GATE DETAIL

SELF FEEDER FOR BARROWS OR LAMBS

SUGGESTED PROCEDURE

Secure good 55 gallon steel drum. Cut top out with cold chisel. Also cut a 7 inch diameter hole in center of bottom and weld or braze a 7 inch diameter spout, 7 1/2 inches long, over the hole. Do not weld on a drum that has held flammable material unless it has been steamed and washed. Then fill with water to point where welding is being done.

Make a tight-fitting lid for the barrel out of heavy sheet metal with a handle on it.

To make the base, secure a rake wheel or something similar that is about 3 feet in diameter. Cut out the hub. Heat and bend the spokes so that they can be cut to support the barrel in a level position about 10 inches above the base. Weld the spokes to the barrel rim in this position.

The base is made of 2" x 10" planks. Fasten the wheel to the base with U-bolts or hook bolts.

BILL OF MATERIALS

1 - 55 gallon steel drum
1 - steel wheel about 3' in diameter
1 piece - 7" sheet metal pipe 7 1/2" long, or metal to make it from
1 piece - heavy sheet steel, 3' x 3' for cover
10 1/2 ft. - 1 1/2" x 1/8" strap iron to make handle and cover rim
4 - 2" x 10" x 3'2" planks for base
U-bolts or hook bolts

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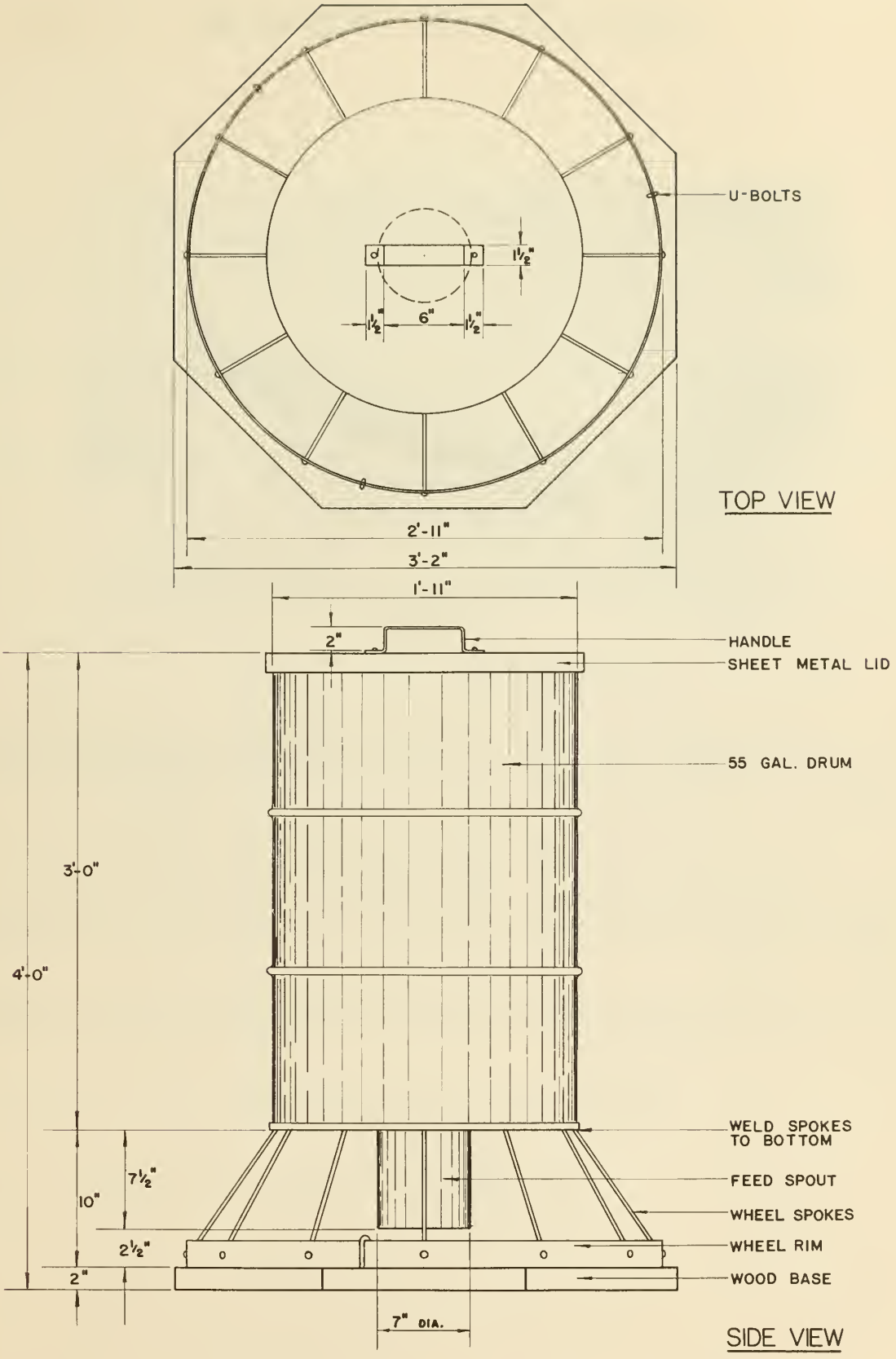
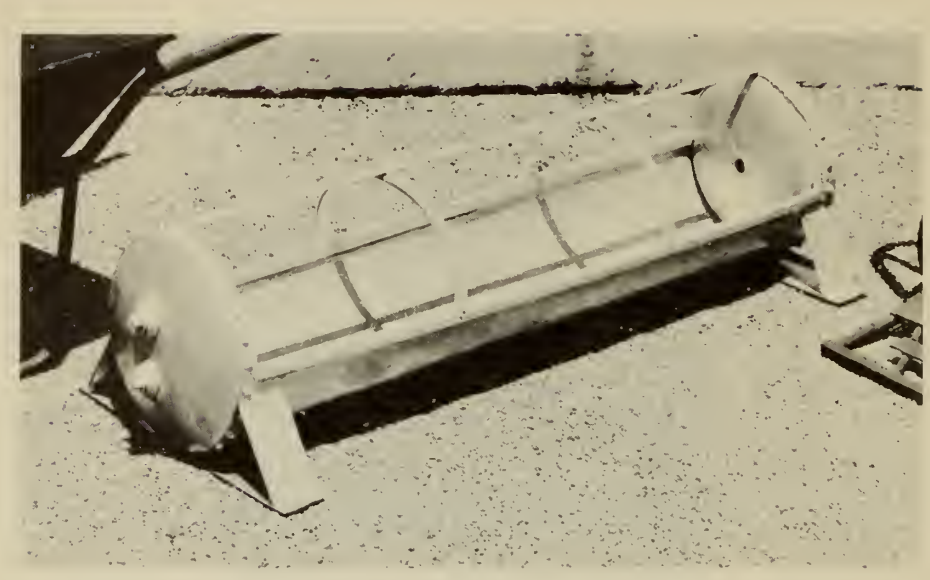

U-BOLTS
1½"
6"
1½"
1½"
TOP VIEW
2'-11"
3'-2"
1'-11"
2"
HANDLE
SHEET METAL LID
55 GAL. DRUM
3'-0"
4'-0"
WELD SPOKES TO BOTTOM
7½"
10"
FEED SPOUT
WHEEL SPOKES
2½"
WHEEL RIM
2"
WOOD BASE
7" DIA.
SIDE VIEW

HOG WATER TROUGH



SUGGESTED PROCEDURE

Obtain a used hot water tank and cut it in two lengthwise with the arc welder. Leave the ends intact. Cover the cut edges with light angle iron, welded at intervals.

Bend the divider bars from 1/2" rod to the same shape as the ends of the trough and weld them in place. Weld a piece of light angle iron across the top of these divider bars to tie them to the ends and to serve as a handle for moving the trough.

Cut 3" x 1/8" flat stock to form the trough legs and braces and weld them in place to complete the project.

BILL OF MATERIALS

1	Used hot water tank
3 pcs.	3/4" x 3/4" x 1/8" angle iron, 5' long
3'2"	1/2" rod
5'6"	3" x 1/8" flat iron

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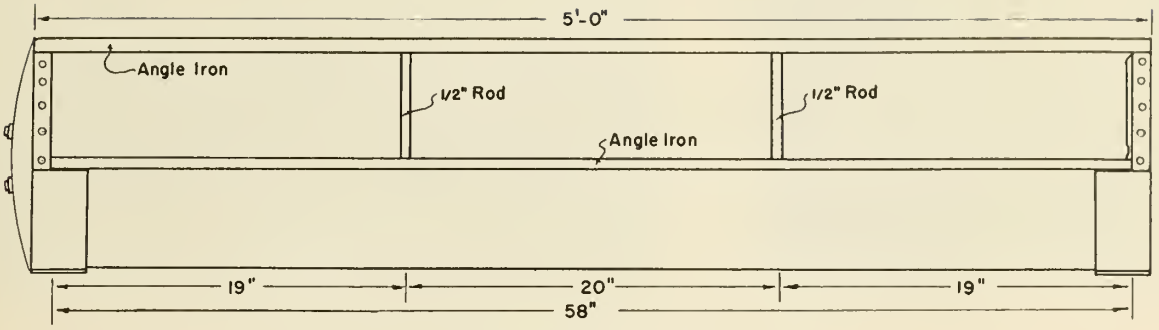
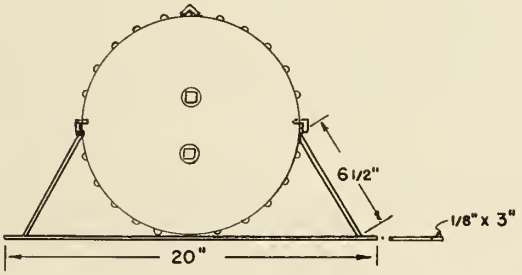
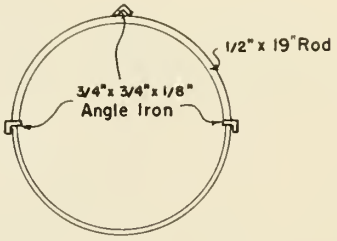


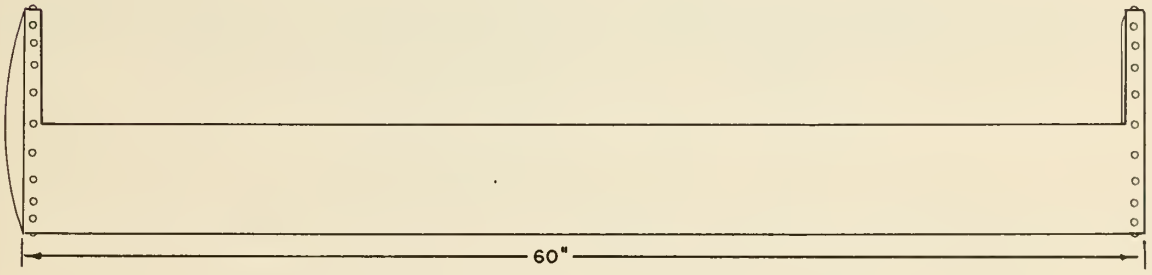
SIDE VIEW – TROUGH



END VIEW



CROSS SECTION AT CENTER



SIDE VIEW – CUT TANK

STOCK WATERER

SUGGESTED PROCEDURE

Secure a heavy water tank about 24" in diameter by about 5' long (or vary all dimensions to fit available tank). Cut the tank in two lengthwise so that the half to be used has a tapped opening for a drain plug in the bottom and an opening for the water connection in one end.

Cut the runners from 1-1/2" pipe, heat and bend the ends up slightly as shown. Cut the legs and grind the upper ends to fit the curvature of the tank. Weld the legs to the tank and to the runners. Cut and weld in the cross braces.

Weld in place the two short pieces of angle iron which form the grill supports. Attach the float valve and adjust the float to the water level desired in the tank.

Construct the grill to protect the float as shown and bolt it to the grill supports so that it can be removed if necessary to service the float valve.

BILL OF MATERIALS

2 pcs.	1-1/2" pipe, 6' long -- runners
4 pcs.	1-1/2" pipe, 23" long -- legs
2 pcs.	1" pipe, 22" long -- braces
2 pcs.	1" x 1" x 1/8" angle iron, 9" long -- grill supports
2 pcs.	1-1/2" x 1-1/2" x 3/16" angle iron, 25" long -- grill support bars
10 pcs.	3/4" x 1/8" strap iron, 9" long -- grill slats
4	3/8" x 3/4" galvanized machine bolts
1	float valve assembly and float
	Pipe or hose connections as needed

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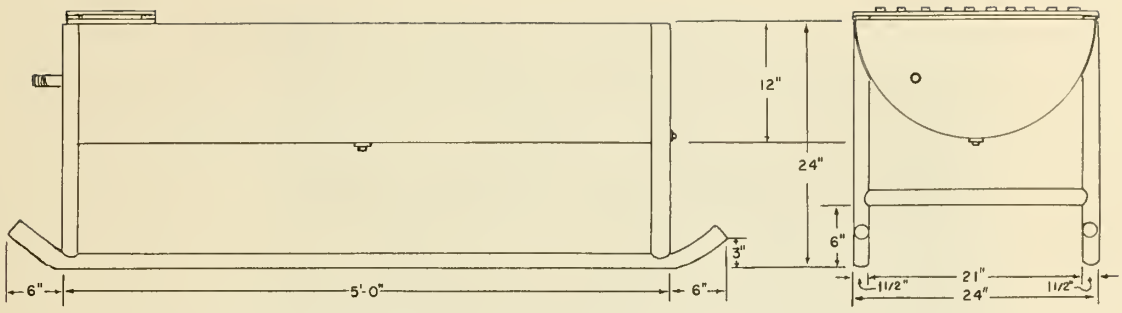
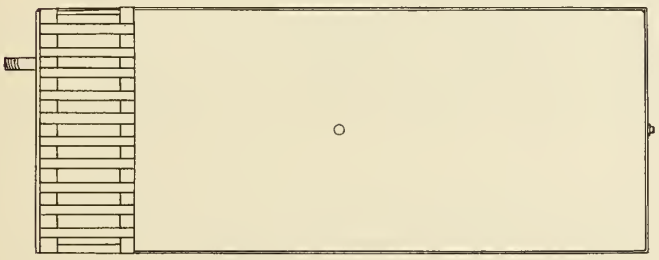
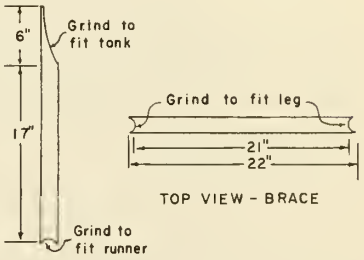


SIDE VIEW

END VIEW

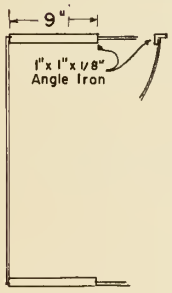


TOP VIEW

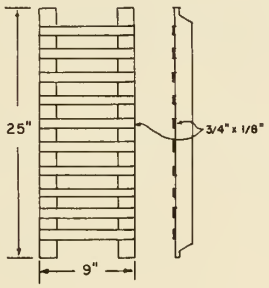


TOP VIEW - BRACE

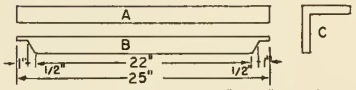
LEG PIECE



GRILL SUPPORTS

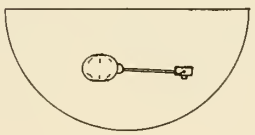


TOP AND SIDE VIEWS - GRILL



GRILL SUPPORT BAR - 1 1/2"x 1 1/2"x 3/16"

A - Top View
B - Side View
C - End View



POSITION - SHUT-OFF VALVE AND FLOAT

METAL PIPE CALF CREEP

SUGGESTED PROCEDURE

Build the two closed panels alike using 1-1/2" black pipe for the corner posts, 1" black pipe for horizontal rails, and 1-1/4" x 1/4" flat stock for the center and diagonal braces.

Two alternate plans for the entrance panels are shown -- 1 with fixed size openings, and 1 with adjustable openings. For the fixed openings, 1" pipe is bent in the form of an arch and welded in each end of the panel.

To make the entrances adjustable, build sliding gates using 1" outside diameter tubing for the horizontal bars so they will slide inside the 1" pipes. The vertical gate post is fastened top and bottom by means of a U-shaped loop so that it slides when gate opening is adjusted. A bolt through the top loop and the top pipe holds the gate in the desired position.

Follow the detailed plan in constructing the corner connections. Note the 8" x 8" x 3/8" plate welded to the bottom of one post with a 2" pipe post receptacle to receive the bottom end of the other post. The 1/2" cap screw with a nut inside and outside the pipe forms the top support and fits in the slotted hole to make a quick but secure connection at each corner.

BILL OF MATERIALS
(Use A, B or C, and D)

A. For 2 closed panels

4 pcs.	1-1/2" black pipe, 4'2" long	4 pcs.	1-1/4" flat bar, 8'3" long
8 pcs.	1" black pipe, 15' long	2 pcs.	1-1/4" x 1/4" flat bar, 32-1/2" long

B. For 2 fixed size entrance panels

4 pcs.	1-1/2" black pipe, 4'2" long	4 pcs.	1" black pipe, 16" long
2 pcs.	1" black pipe, 15' long	2 pcs.	1-1/4" x 1/4" flat bar, 32-1/2" long
6 pcs.	1" black pipe, 12'4" long	4 pcs.	1-1/4" x 1/4" flat bar, 6'9" long
4 pcs.	1" black pipe, 4'8" long		

C. For 2 adjustable entrance panels

4 pcs.	1-1/2" black pipe, 4'2" long	4 pcs.	1" black pipe, 3' long
2 pcs.	1" black pipe, 15' long	12 pcs.	1" O.D. tubing, 3' long
6 pcs.	1" black pipe, 9' long	2 pcs.	1-1/4" x 1/4" flat bar, 32-1/2" long
4 pcs.	1" black pipe, 34" long	4 pcs.	1-1/4" x 1/4" flat bar, 5' long
4 pcs.	1" black pipe, 3' long (cut into short lengths)	8 pcs.	1-1/4" x 1/4" flat bar, 8" long

D. For corner attachments

4 pcs.	8" x 8" x 3/8" plate	4	1/2" x 1-1/2" cap screws with double nuts
4 pcs.	2" pipe, 2" long		

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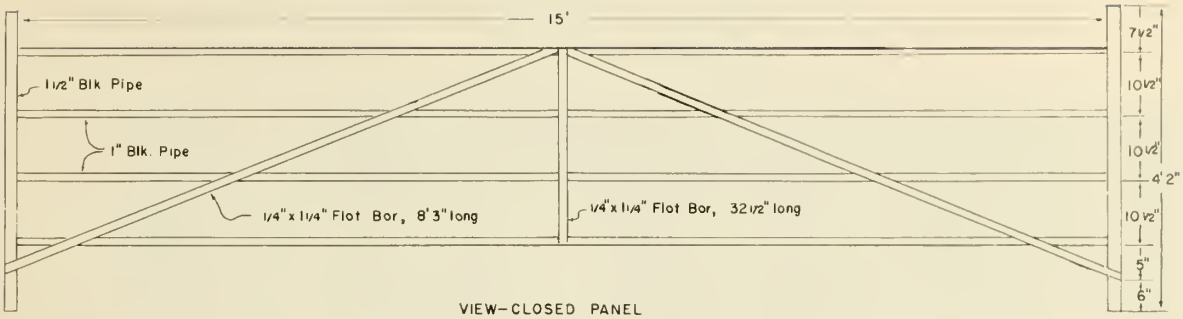
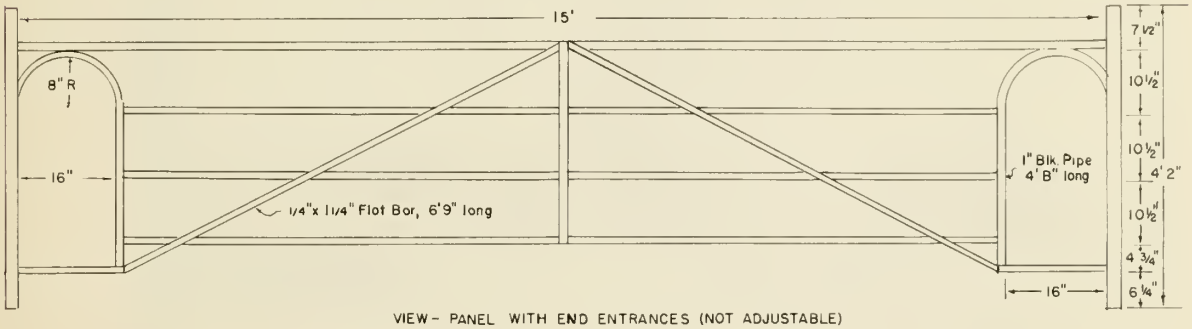
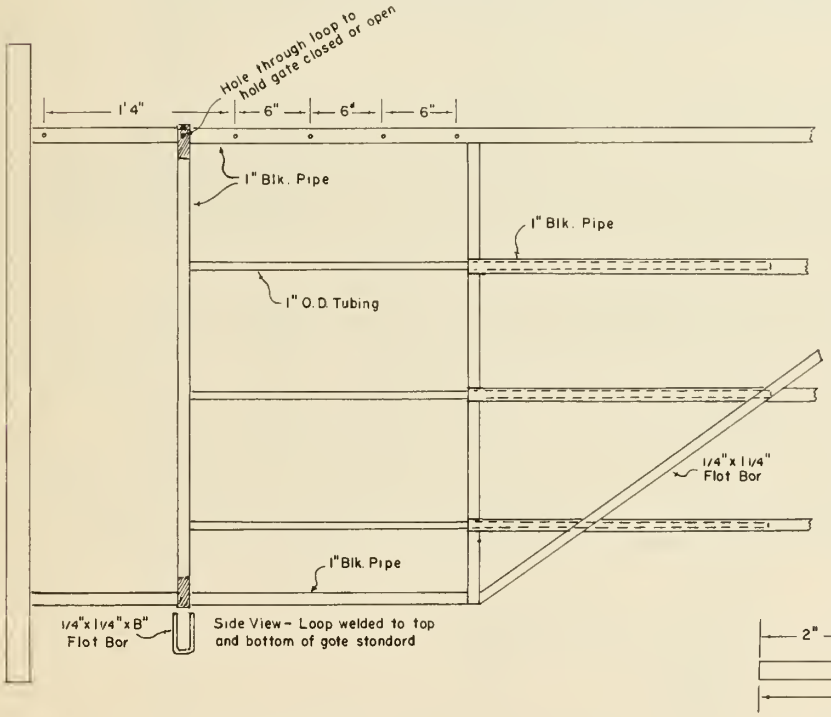


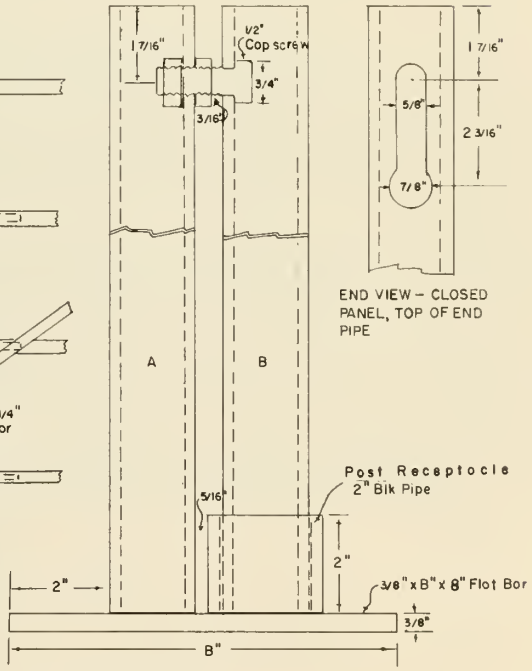
VIEW–CLOSED PANEL



VIEW– PANEL WITH END ENTRANCES (NOT ADJUSTABLE)



VIEW– ADJUSTABLE CREEP GATE



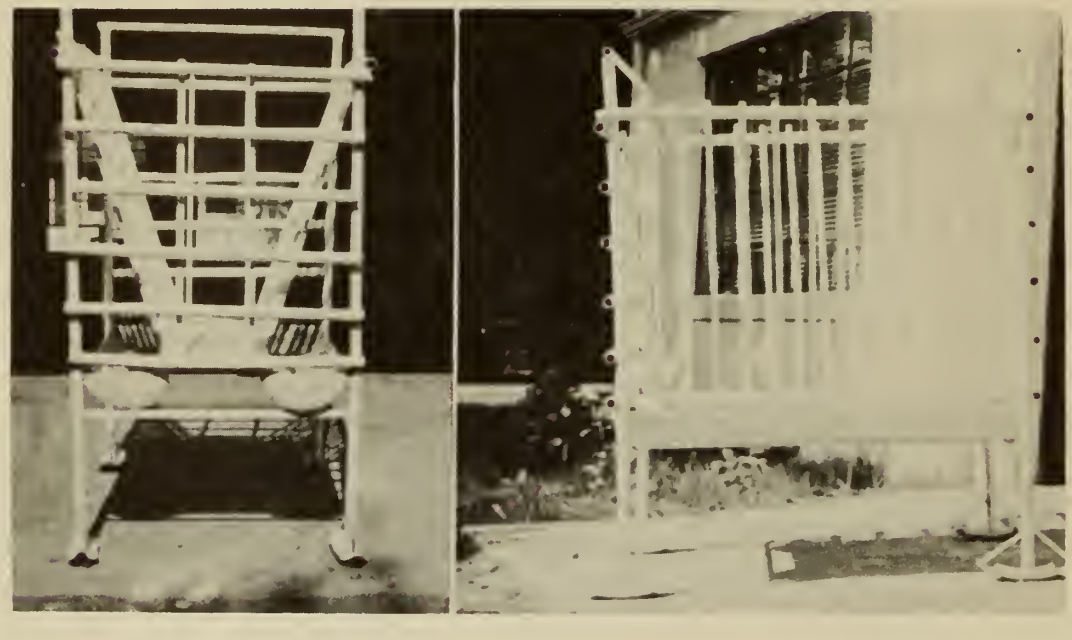
END VIEW – CLOSED PANEL, TOP OF END PIPE

VIEW– LOCKED CORNER

A – Cross section of end post of entronce section – end view

B – Cross section of end post of closed section – side view

COMBINATION GRAIN AND HAY FEEDER FOR CALVES



SUGGESTED PROCEDURE

Secure used range boiler and cut it in two lengthwise to make the two troughs.

Cut the four corner posts and end cross pieces from 1 1/2" pipe. Weld the two end frames together including the 1" x 3/8" bars which are to support the troughs.

Stand the ends upright and clamp the troughs and the 1 1/2" pipes which form the upper side pieces in place. Weld these parts together.

Weld the 1' x 5' piece of sheet metal in place to fill the space between the two troughs. Cut and weld the 1/2" pipes in place to form the hay manger.

Cut the steel wheel in sections so that each section has three spokes. Weld these sections onto the bottom of the corner posts to form runners with the center spoke inside the pipe and the other two bent and welded as braces.

BILL OF MATERIALS

1 - used 30 gallon range boiler
84 ft. - 1 1/2" pipe
123 ft. - 1/2" pipe
6 1/2 ft. - 1" x 3/8" flat bar stock
1 piece - 1/8" sheet metal, 1' x 5'
1 steel wagon wheel.

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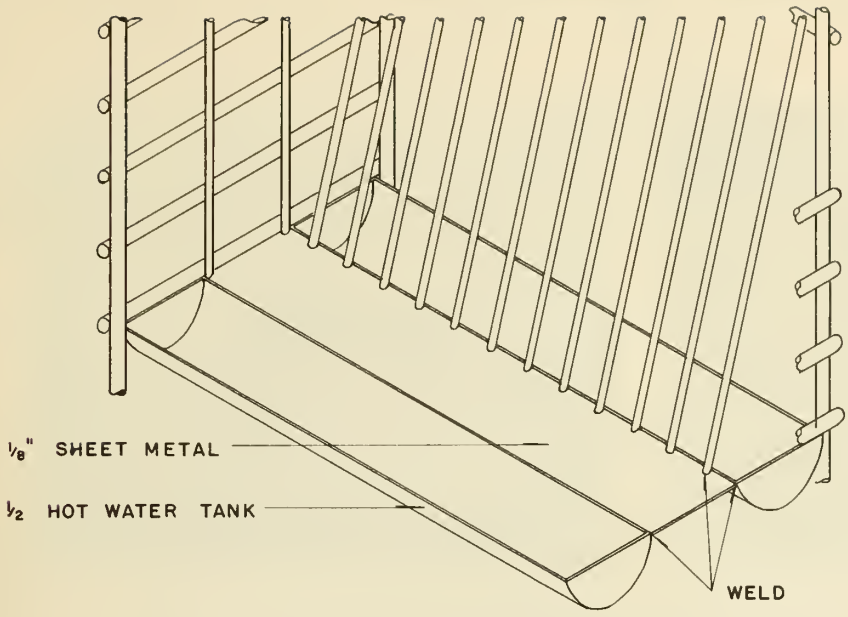
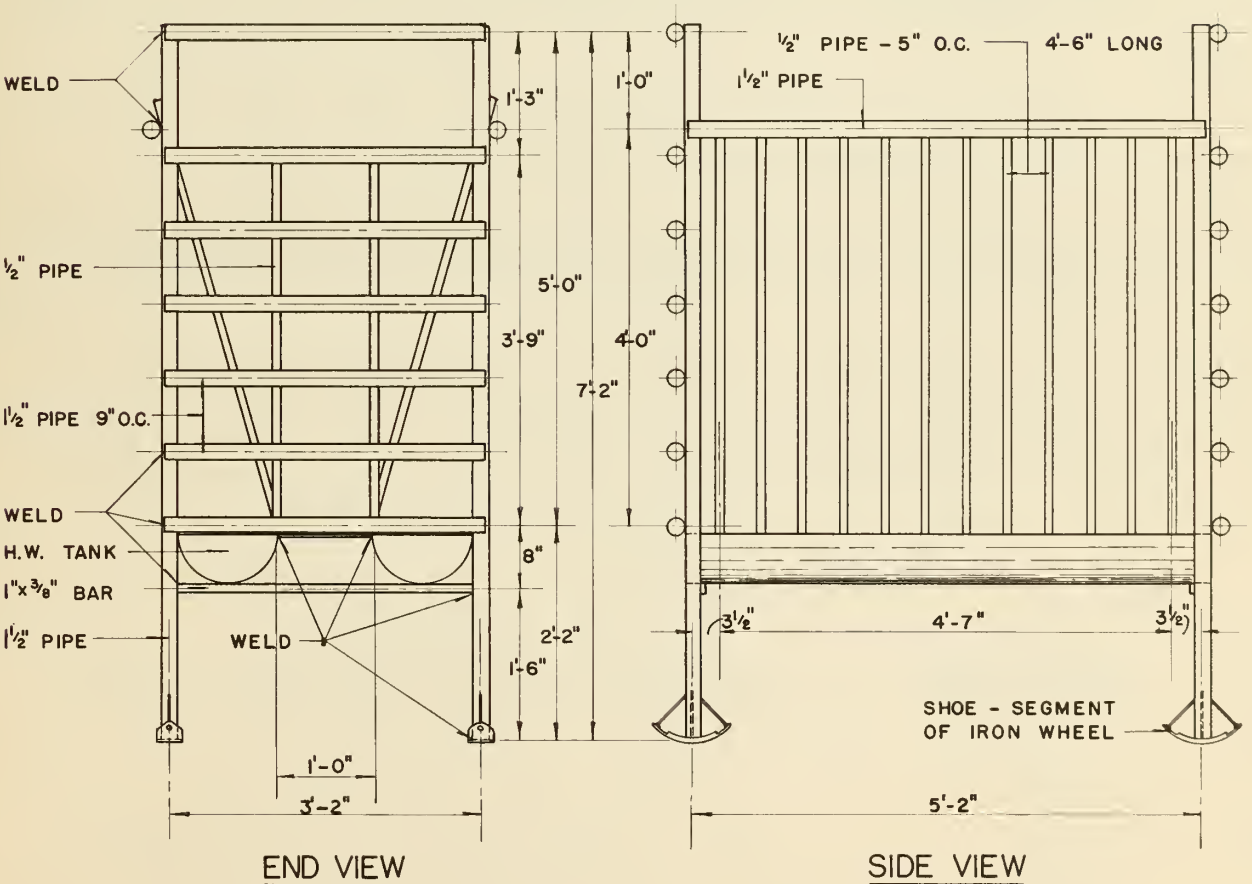


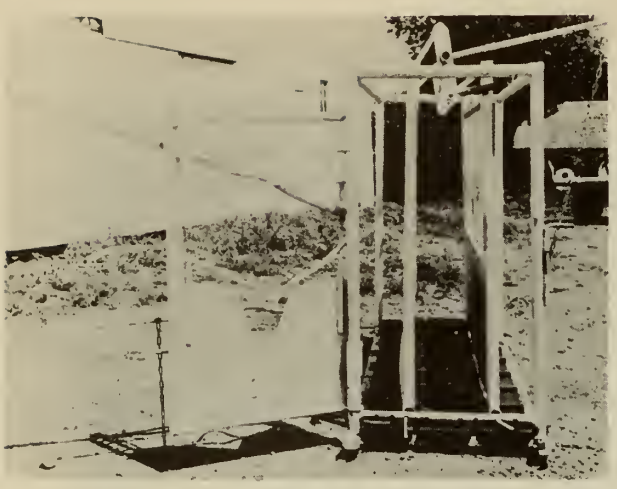
CUTAWAY ISOMETRIC VIEW - FEED TROUGH DETAIL

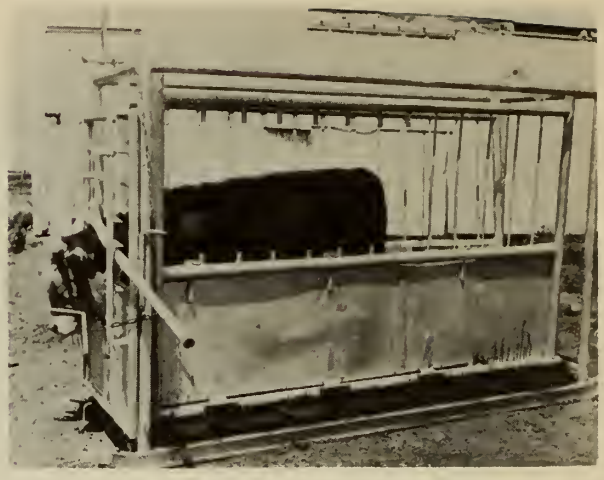


END VIEW

SIDE VIEW

CATTLE SQUEEZE





SUGGESTED PROCEDURE

Cut runners, heat and bend ends up. Cut and weld main frame together, taking care to drill holes in lower squeeze panel supports and to slip 2 1/2" pipe sleeves onto front post for gate hinges before welding. Bolt floor and cleats in place.

Construct the two squeeze panels to fit inside main frame. Note that part of one side panel is hinged. Both panels have removable rods in front. Rods are removed by lifting until bottom ends clear pipe sockets.

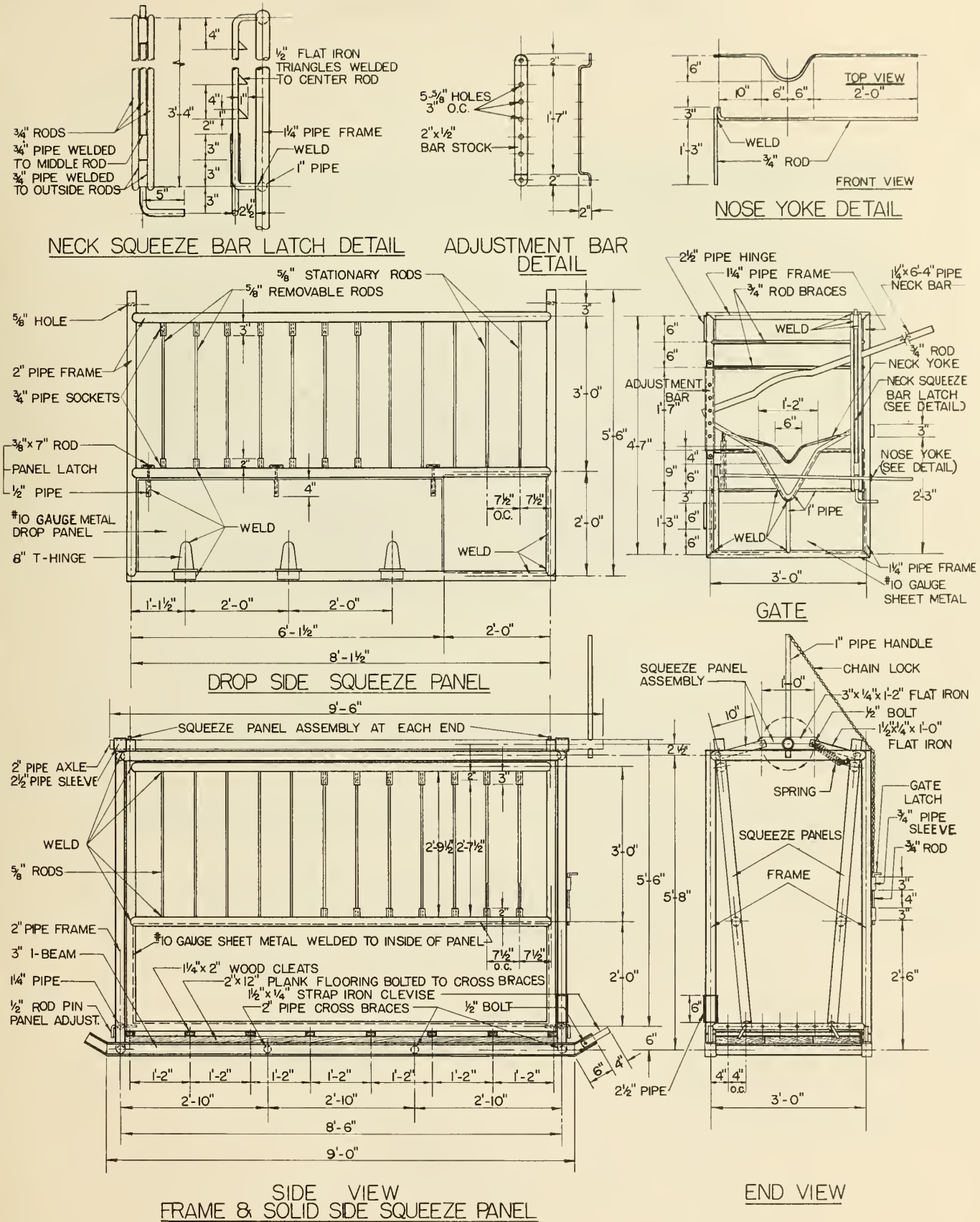
Constructs squeeze axle with pipe handle, 3" x 1/4" crosspieces and 1 1/2" x 1/4" connecting arms. Axle turns in 2 1/2" pipe bearings welded to top frame crosspieces and can be kept from sliding endways with collars or pins. Springs attached to the frame keep the squeeze panels open when animal enters the chute.

Front gate is made adjustable for small or large animals. Neck yoke is removed for all but small calves. Neck squeeze bar is held down by flat iron triangles welded to the center rod of the squeeze bar latch. Bar is released by turning center rod to one side. Chains attached to squeeze panel handle and nose yoke are secured to hooks welded to front frame upright. Gate swings open to release animal when pin is pulled in gate latch.

BILL OF MATERIALS

20 ft. - 3" I-beam
2 ft. 2 1/2" pipe
122 ft. - 2" pipe
28 ft. - 1 1/4" pipe
11 ft. - 1" pipe
11 ft. - 3/4" pipe
1 ft. - 1/2" pipe
32 ft. - 3/4" rod
66 ft. - 5/8" rod
4 ft. - 1/2" rod
3 ft. - 3/8" rod
2 1/2 ft. - 3" x 1/4" flat steel
7 ft. - 1 1/2" x 1/4" flat steel
3 ft. - 2" x 1/2" flat steel
2 sheets - 2' x 8'2", #10 gauge steel
1 sheet - 2' x 3', #10 gauge steel
3 - 2" x 12" x 9', hardwood planks
8 - 1 1/4" x 2" x 3', hardwood cleats
3 - 8" Tee hinges, Bolts, springs, chain.

* * * * *


½" FLAT IRON TRIANGLES WELDED TO CENTER ROD
¾" RODS
¾" PIPE WELDED TO MIDDLE ROD
¾" PIPE WELDED TO OUTSIDE RODS
1¼" PIPE FRAME
WELD
1" PIPE
5-⅜" HOLES 3" O.C.
2"x½" BAR STOCK
TOP VIEW
WELD
¾" ROD
FRONT VIEW
NECK SQUEEZE BAR LATCH DETAIL
ADJUSTMENT BAR DETAIL
NOSE YOKE DETAIL
⅝" STATIONARY RODS
⅝" REMOVABLE RODS
⅝" HOLE
2" PIPE FRAME
¾" PIPE SOCKETS
⅜"x 7" ROD
PANEL LATCH
½" PIPE
#10 GAUGE METAL DROP PANEL
8" T-HINGE
WELD
2½" PIPE HINGE
1¼" PIPE FRAME
¾" ROD BRACES
1¼"x 6'-4" PIPE NECK BAR
¾" ROD
NECK YOKE
NECK SQUEEZE BAR LATCH (SEE DETAIL)
NOSE YOKE (SEE DETAIL)
ADJUSTMENT BAR
1" PIPE
1¼" PIPE FRAME
#10 GAUGE SHEET METAL
GATE
DROP SIDE SQUEEZE PANEL
1" PIPE HANDLE
CHAIN LOCK
SQUEEZE PANEL ASSEMBLY
3"x¼"x 1'-2" FLAT IRON
½" BOLT
1½"x¼"x 1'-0" FLAT IRON
SPRING
GATE LATCH
¾" PIPE SLEEVE
¾" ROD
SQUEEZE PANELS
FRAME
SQUEEZE PANEL ASSEMBLY AT EACH END
2" PIPE AXLE
2½" PIPE SLEEVE
WELD
⅝" RODS
2" PIPE FRAME
3" I-BEAM
1¼" PIPE
½" ROD PIN PANEL ADJUST.
#10 GAUGE SHEET METAL WELDED TO INSIDE OF PANEL
1¼"x 2" WOOD CLEATS
2"x 12" PLANK FLOORING BOLTED TO CROSS BRACES
1½"x¼" STRAP IRON CLEVISE
2" PIPE CROSS BRACES
½" BOLT
2½" PIPE
SIDE VIEW
FRAME & SOLID SIDE SQUEEZE PANEL
END VIEW

TRACTOR CARRY-ALL

SUGGESTED PROCEDURE

Cut and bend the upright pieces of 3" x 1/2" to shape shown. Weld these together at the top with the 2 1/2" piece of 3" x 1/2" steel in between. Cut the 2" channel pieces and weld the uprights to them, bracing them diagonally with the 1 ft. pieces of 2" x 1/4" flat iron. Drill the uprights for the 7/8" hitch pins.

Cut the two pieces of 1" x 1" x 1/8" angle and weld them to the frame in an upright position.

Bolt on the three 2" x 4" wood cross pieces and form stake pockets from 3" x 1/8" stock to fit on the ends of the cross pieces. Build the floor and box from 1" wood material, using 2" x 4" stakes on the sides.

BILL OF MATERIALS

10 ft. - 2" channel iron
8 ft. - 3" x 1/2" flat stock
2 ft. - 2" x 1/4" flat stock
4 ft. - 1" x 1" x 1/8" angle
8 ft. - 3" x 1/8" flat stock
3 - Tractor hitch pins

1 - 2" x 4" x 12'
1 - 2" x 4" x 10'
8 - 1" x 4" x 8' matched flooring
1 - 1" x 12" x 12'
1 - 1" x 12" x 8'
1 - 1" x 6" x 8'
Bolts

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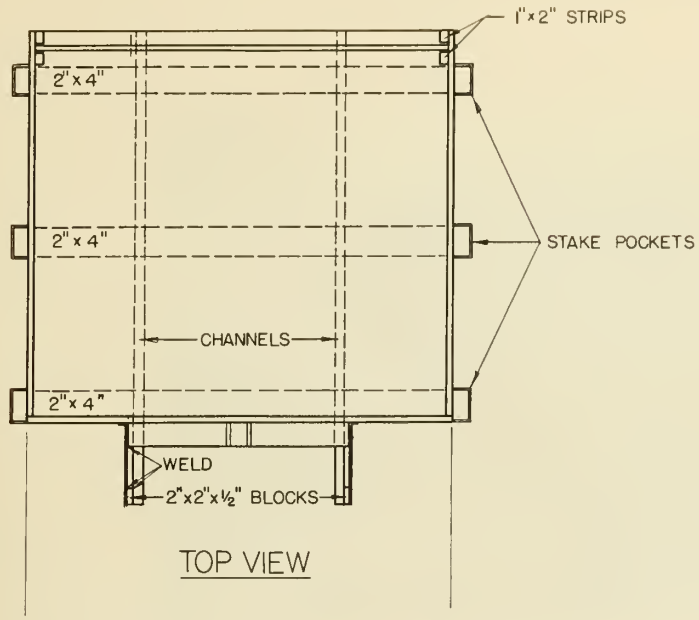
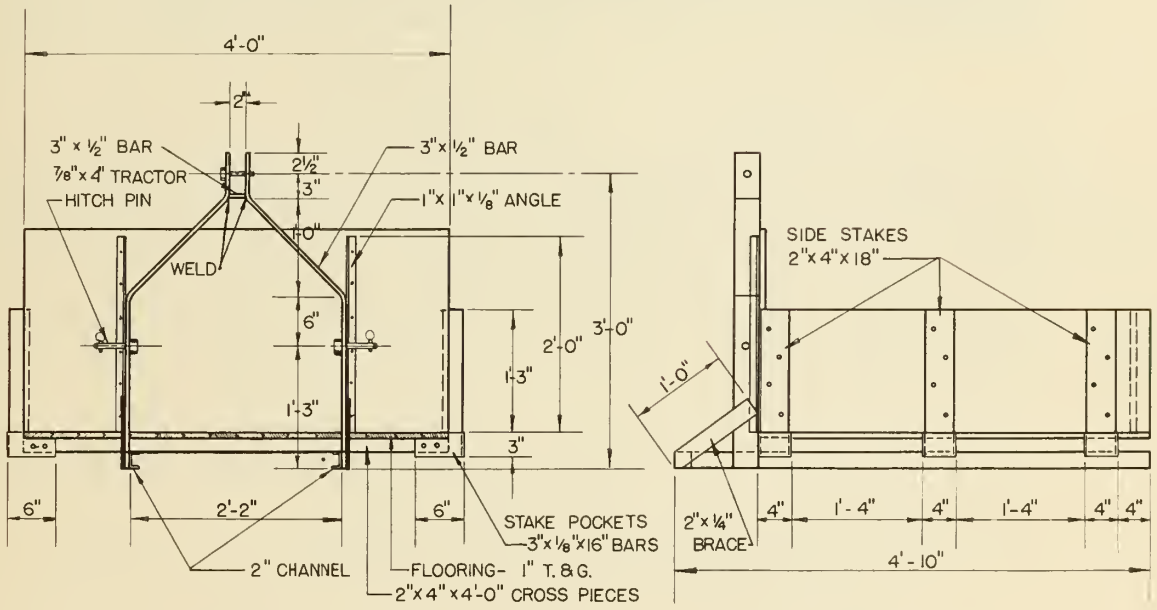


TOP VIEW



FRONT VIEW

SIDE VIEW

ALL-PURPOSE CART

SUGGESTED PROCEDURE

Two 10" ball-bearing, rubber-tired wheels and one 6" wheel of similar type but with a swivel are secured. Parts of the framework for the cart are cut and welded together. It will be necessary to build up supports for the wheels so that the bottom of the cart will be level and about 1 foot off the floor.

The sides, bottom, and ends are cut out of 3/4" plywood and are secured to the angle iron frame with bolts.

BILL OF MATERIALS

12 ft. - 1 1/2" x 1 1/2" x 3/16" angle
8 ft. - 1" x 1" x 1/8" angle
12 ft. - 1 1/2" x 1/4" flat iron
1 piece - 3/4" shaft, 2 ft. long
2 - 10" rubber-tired wheels
1 - 6" rubber-tired swivel wheel
1 piece - 3/4" plywood, 2' x 3' 2"
2 pieces - 3/4" plywood, 2' x 2'
2 pieces - 3/4" plywood, 2' x 6'
Bolts
Welding Electrode

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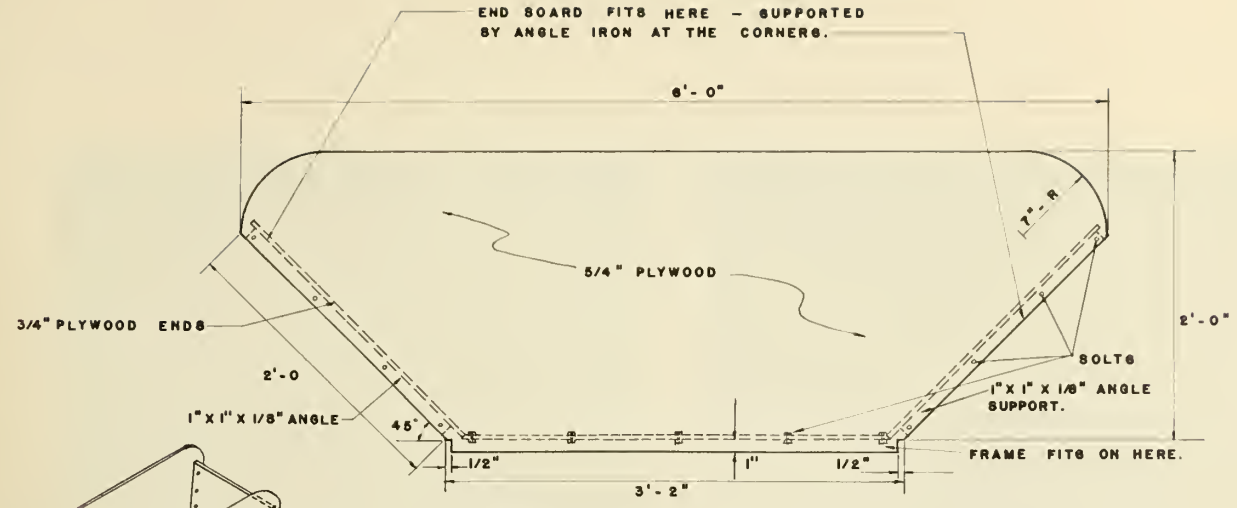
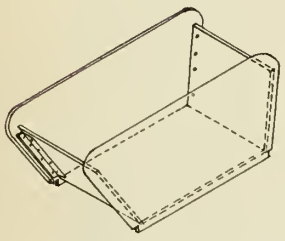
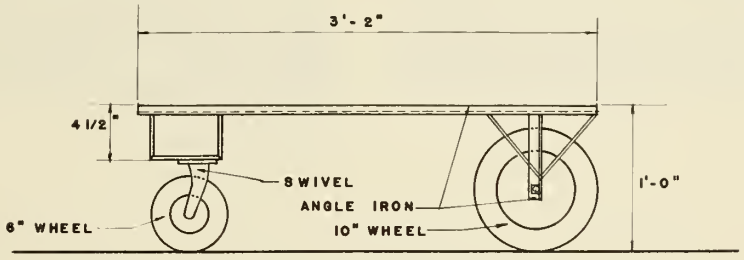


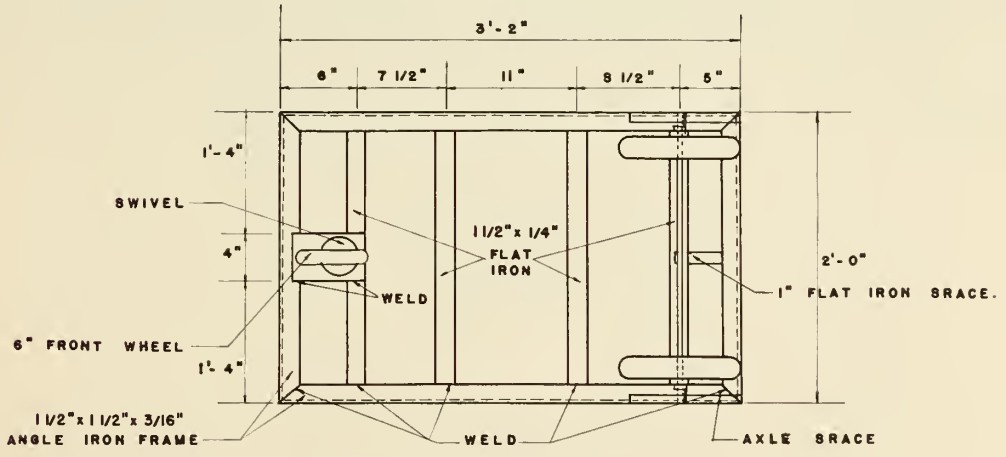
BOX - SIDE VIEW



ISOMETRIC



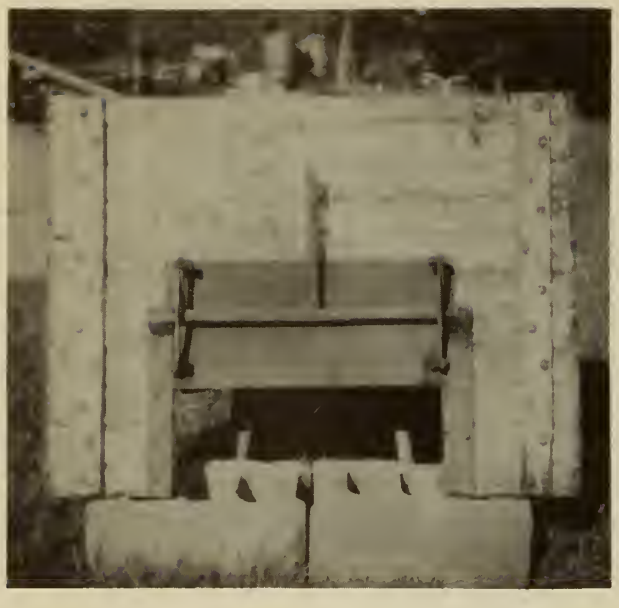
FRAME - SIDE VIEW



FRAME - BOTTOM VIEW

NOTE:
ALL FRAME JOINTS ARE WELDED.

ENDGATE



SUGGESTED PROCEDURE

Cut the sliding endgate out of 1/8" sheet iron. Make end slides, tack-welding 1/8" pieces to 3/16" pieces to hold them in place while holes are drilled. Cut and weld 1 3/4" x 1 3/4" x 1/2" blocks in place.

Cut 3/4" pipe pieces and 1" x 1/4" flat pieces for lift arms. Heat and bend lower lift arms carefully. Drill all pieces accurately.

Weld upper lift arms to ends of long 3/4" pipe so the 5/8" holes center on the pipe. Weld handle onto long pipe also. Insert 5/8" rod and weld ends to blocks at upper ends of slides. Weld 1" x 1/4" bracket pieces to endgate.

Bolt arm connections and bolt completed endgate to truck or trailer box.

BILL OF MATERIALS

2' - 2" - 3/4" x 3/16" Flat Iron
2' - 2" - 1 3/4" x 1/8" Flat Iron
2' - 6" - 1" x 1/4" Flat Iron
3 1/2" - 1 3/4" x 1/2" Flat Iron
2' - 6" - 3/4" Pipe
2' - 0" - 5/8" Rod
1 piece - 9" x 1' 9" x 1/8" Sheet Iron
4 - 3/8" x 1" Machine Bolts
8 - 5/16" x 1 1/2" Machine bolts with washers.

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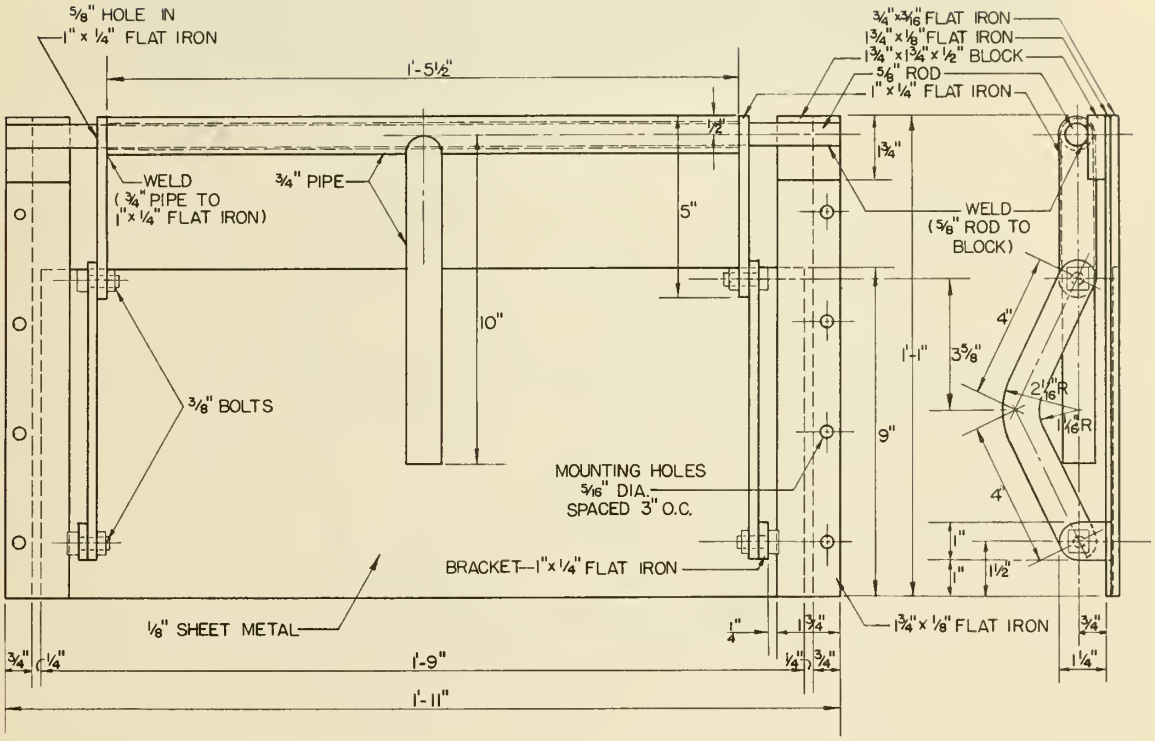
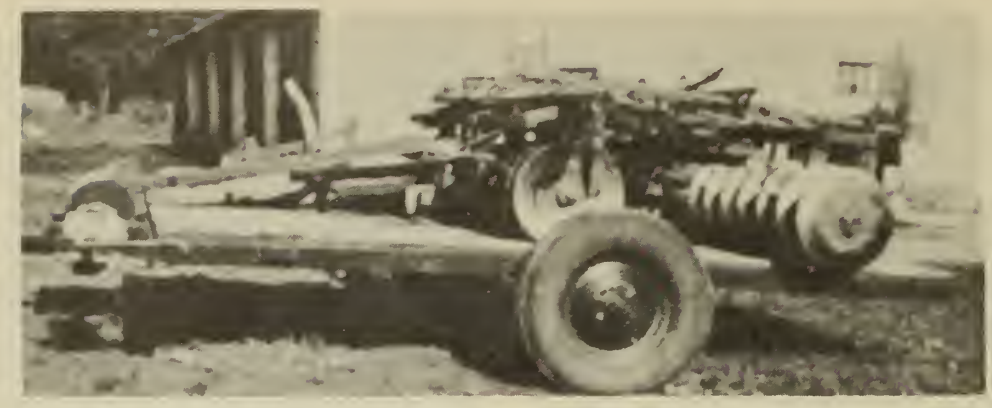


FRONT VIEW

SIDE VIEW

IMPLEMENT TRAILER



SUGGESTED PROCEDURE

Secure truck front axle, wheels, and tires. Cut axle leaving stubs about 1 ft. long. Make trailer axle by welding two 4" x 1/4" angles together in form of a box, 7 ft. long. Weld the stubs onto the lower side of the trailer axle, reinforcing the weld by using straps made of 2" x 1/4" flat stock.

Make trailer tongue by welding together two 2" x 3" x 3/16" angles 9 ft. long. Bend and weld a hitch on one end, using 2" x 1/2" flat stock. Drill or punch a 3/4" hole in the hitch for a coupling pin. Weld the other end of the tongue to the center of the trailer axle, using a 2" x 1/2" strap to reinforce the weld.

Make the frame from 4" x 4" x 1/4" angle stock, lapped and welded at the corners. Bend the stake pockets from 1 1/2" x 1/4" flat stock and weld them to the frame. Weld the frame onto the axle and tongue.

Construct the winch drum using a section of 5" pipe with side flanges made from 10" diameter circles cut from 1/4" stock. Weld drum to a piece of 1" shaft and mount two bearings on a frame of 3" x 3" x 1/2" angle stock. Mount an auto transmission, fitted with a crank, to be used as a gear reduction unit. You may wish to weld a section of a universal joint to the 1" shaft so that the spline can be used to connect to the transmission shaft.

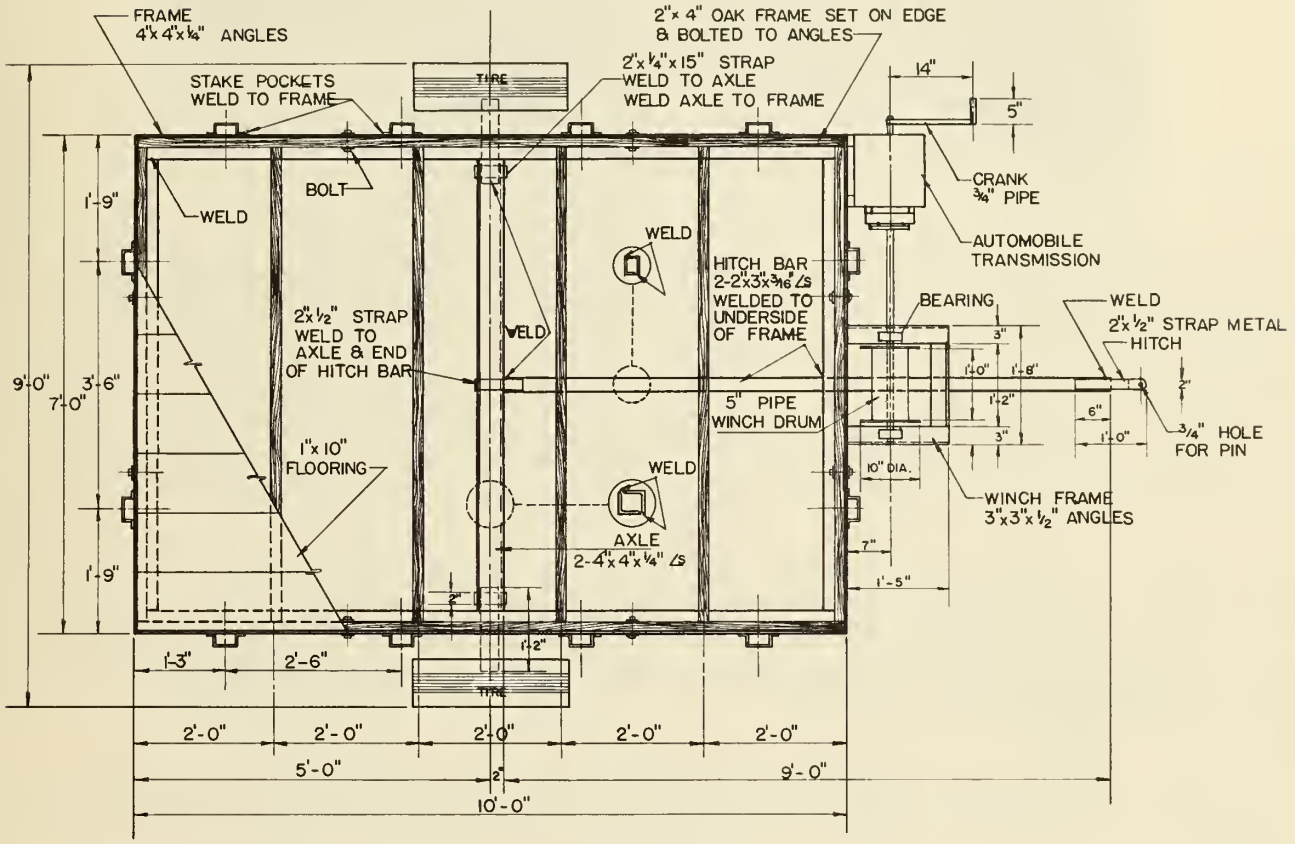
Wood frame of trailer is 2" x 4" oak bolted to the angle iron frame. Trailer floor is 1" x 10" oak.

BILL OF MATERIALS

48 ft - 4" x 4" x 1/4" angle
4 1/2 ft - 3" x 3" x 1/2" angle
18 ft - 3" x 3" x 3/16" angle
1 ft - 5" pipe
2 - 10" diameter circles cut from 1/4" stock
3 ft 1" shafting
2 - 1" bearings
1 - auto transmission
3 ft - 2" x 1/2" flat bar stock
2 1/2 ft - 2" x 1/4" flat bar stock
10 ft - 1 1/2" x 1/4" flat bar stock
Crank and cable
2 - 2" x 4" x 10' oak
6 - 2" x 4" x 7' oak
9 - 1" x 10" x 10' oak
Bolts, nails, etc.

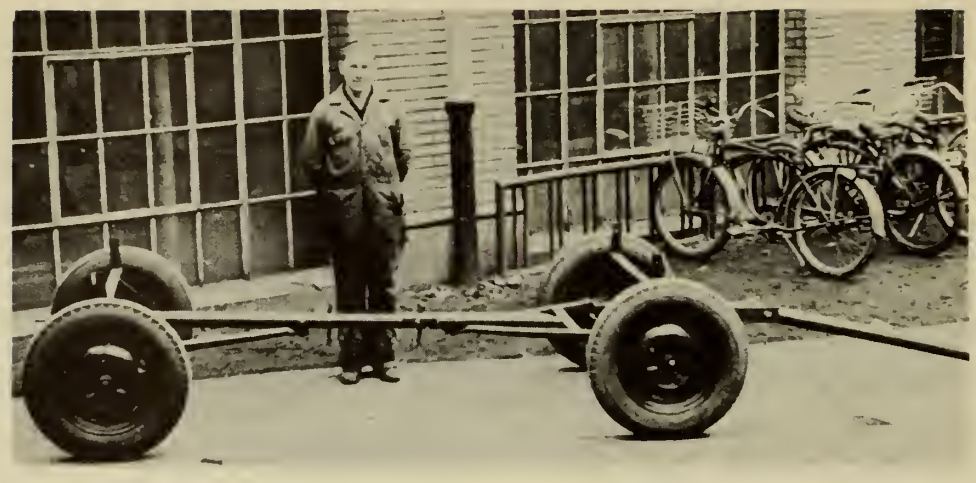
* * * * *

SIDE VIEW



PLAN VIEW

FARM WAGON



SUGGESTED PROCEDURE

Secure two front axles (Model A Ford or equivalent). Invert the axles and weld the tie rod fast on the one to be used at the rear. Construct tongue assembly to guide the front wheels in turning.

Weld the longer piece of 2 1/2" pipe to the rear axle and its wishbone. Weld the shorter piece to the front wishbone. Cut a ring 2" long and one 3" long from the 2 1/2" pipe. Weld the 3" piece to two flat irons and the irons onto the pipe extending back from the front wishbone, leaving space for the 2" ring to fit in as shown.

Drill 3/4" holes in the ring and near the end of the pipe extending to the rear axle. Holes are also drilled in the 2" pipe which is to be used as a coupling pole. When the coupling pole is pinned to the ring in front, a flexible connection is provided which will permit the wagon to ride over bumps and into holes without twisting the frame.

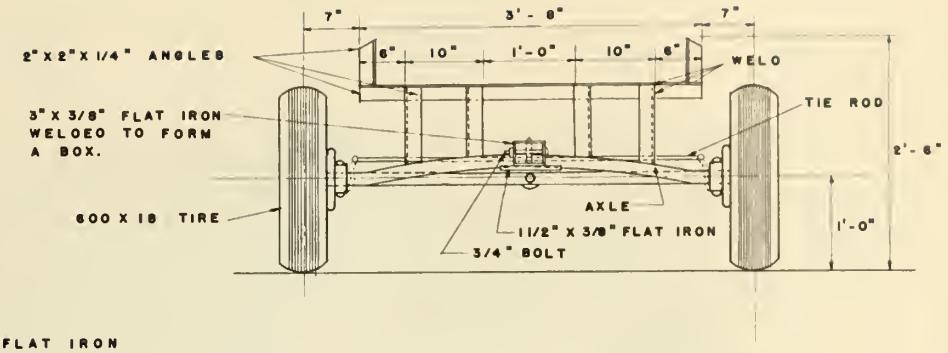
Bolsters, standards, and braces are cut and welded in place. The tongue is made with a hinge joint and a conventional type hitch. Note also that a hitch is provided at the rear end of the wagon to permit connecting something on behind.

BILL OF MATERIALS

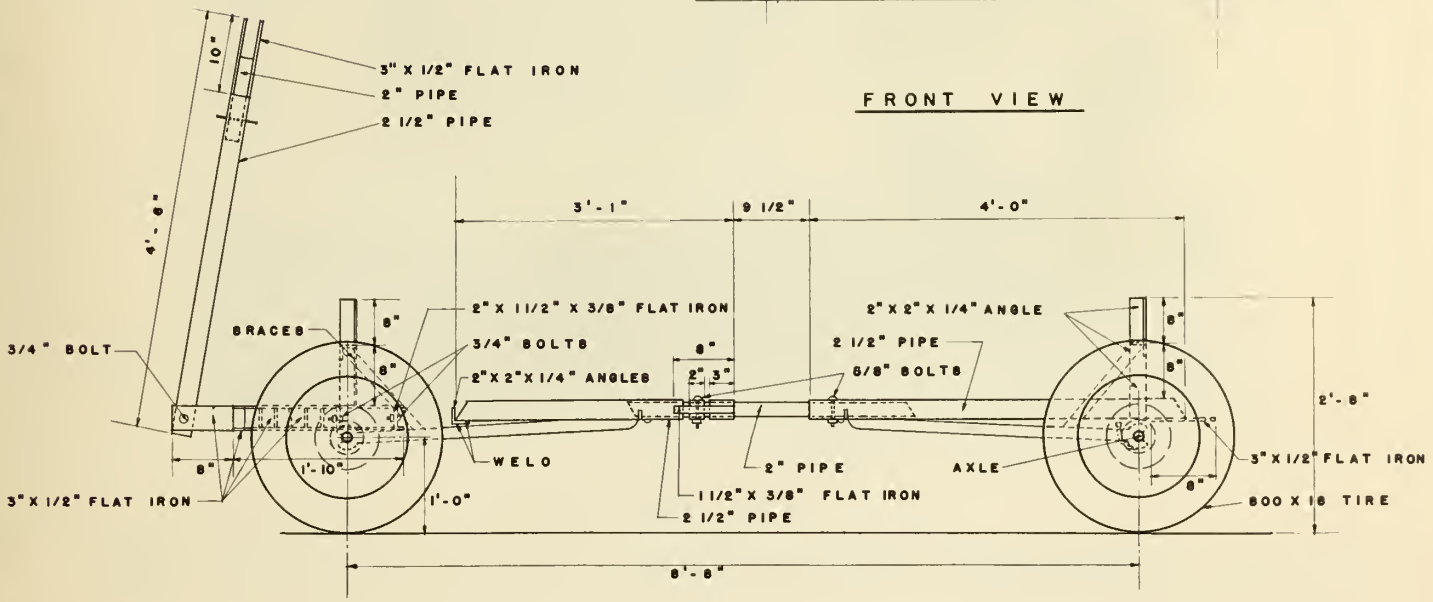
12 ft. - 2 1/2" pipe
5 ft. - 2" pipe
9 ft. - 3" x 1/2" flat iron
4 ft. - 1 1/2" x 3/8" flat iron
17 ft. - 2" x 2" x 1/4" angle iron
3 - 3/4" x 4" bolts
2 - 5/8" hitch pins
2 - auto front axles complete with wheels and tires.

* * * * *

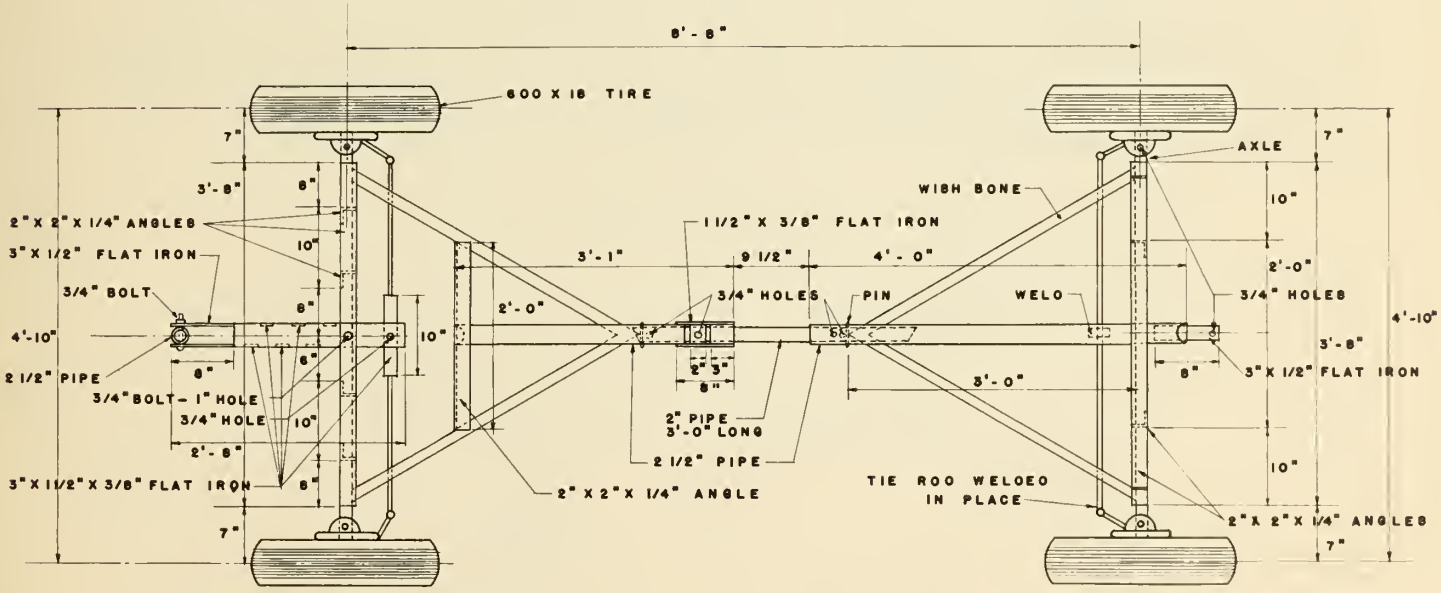
NOTE:
ALL ARC WELDING.



FRONT VIEW

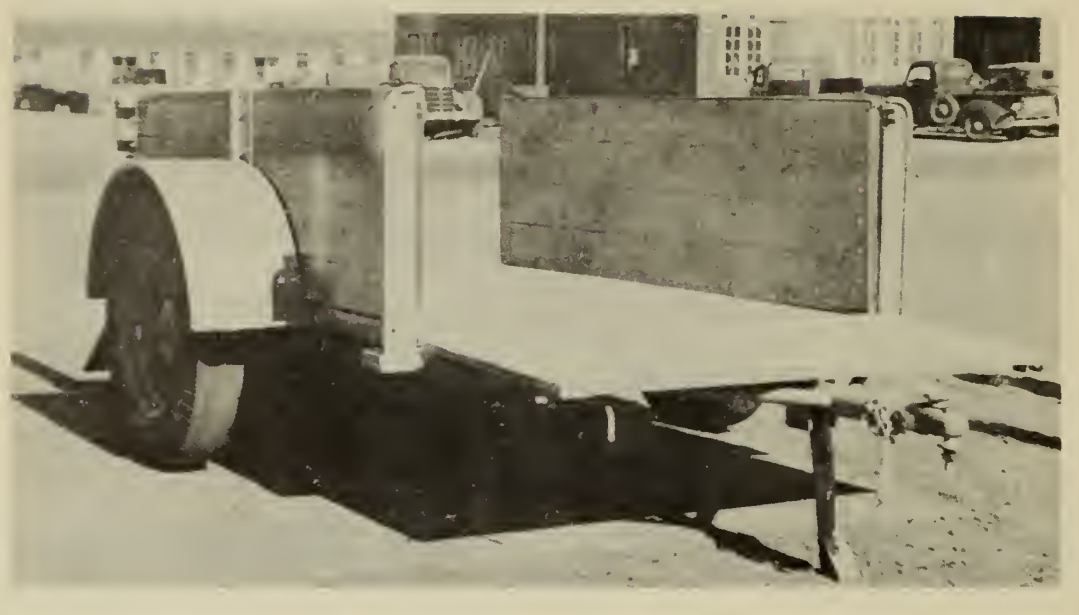


SIDE VIEW



FRONT END | COUPLING POLE | BACK END

UTILITY TRAILER



SUGGESTED PROCEDURE

The axle for this trailer was built by welding two 2" x 2" x 1/4" angle irons together in the form of a box and welding auto front wheel spindles onto the ends.

Frame pieces are cut and welded as shown. Fenders are made from heavy sheet metal welded to a bent frame made of 1/2" pipe.

Bottom, sides and end gates are lined with 1" tongue and grooved lumber. Both front and rear end gates are hinged so that long material can be hauled in the trailer. The end gate hinges are made from three short pieces of 1/2" pipe with a pin made from 5/8" rod, drilled and held by cotters.

BILL OF MATERIALS

48 ft. - 2" x 2" x 1/4" angle
32 ft. - 1" x 1" x 1/8" angle
1 ft. - 1 1/2" x 2" x 1/4" angle
8 ft. - 2" T iron
1 ft. - 2" x 2" x 1/4" channel
3 1/2 ft. - 1 1/2" x 3/4" x 1/8" channel
8 ft. - 3" x 1/8" flat iron
1 ft. - 4" x 1/4" flat iron
1 ft. - 2" x 3/8" flat iron
3 ft. - 5/8" rod
10 ft. - 1/2" rod
5 1/2 ft. - 2" pipe
6 ft. - 3/4" pipe
7 ft. - 1/2" pipe
Commercial ball hitch
Auto Front wheels, spindles, tires.
4 - 2" compression springs
Bolts
Washers
Cotters
Welding electrode

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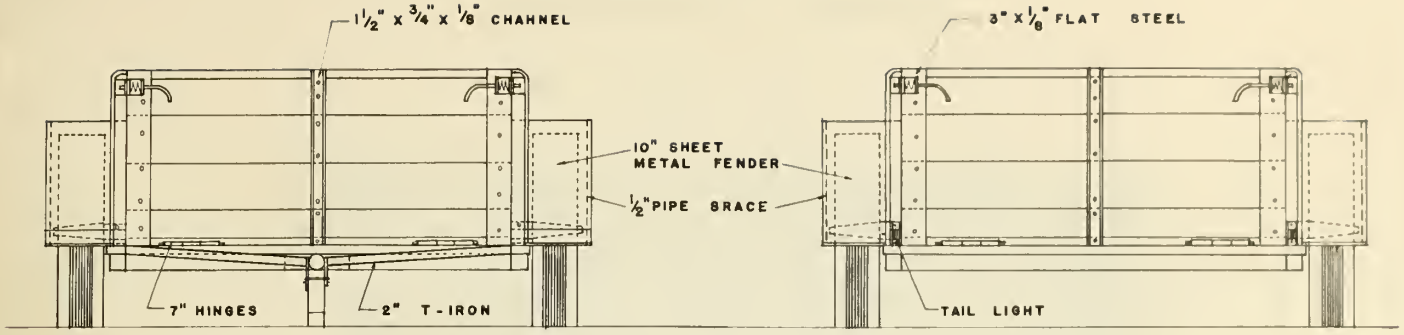
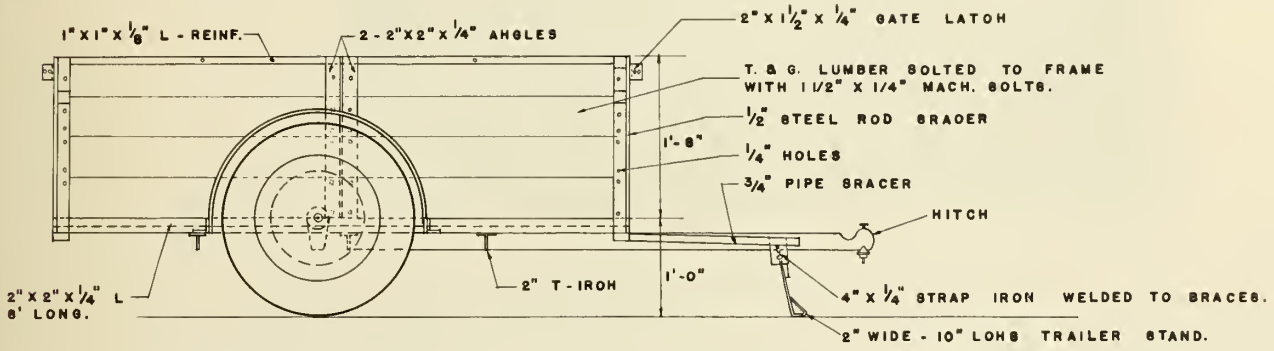
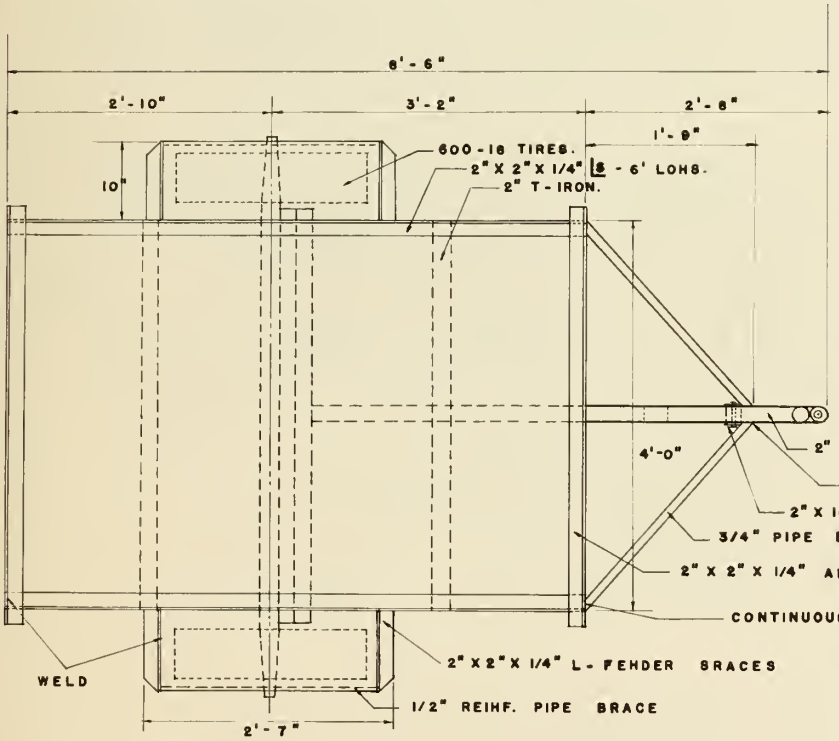


FRONT VIEW

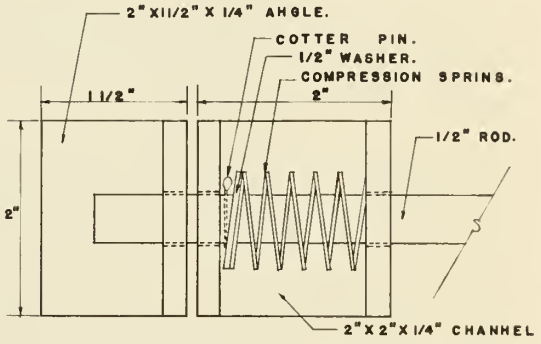
REAR VIEW


1" x 1" x ⅛" L - REINF.
2 - 2" x 2" x ¼" ANGLES
2" x 1½" x ¼" GATE LATCH
T. & G. LUMBER BOLTED TO FRAME WITH 1 1/2" x 1/4" MACH. BOLTS.
½" STEEL ROD SPACER
1'-8"
¼" HOLES
¾" PIPE SPACER
HITCH
2" x 2" x ¼" L 8' LONG.
2" T-IRON
1'-0"
4" x ¼" STRAP IRON WELDED TO BRACES.
2" WIDE - 10" LONG TRAILER STAND.

SIDE ELEVATION

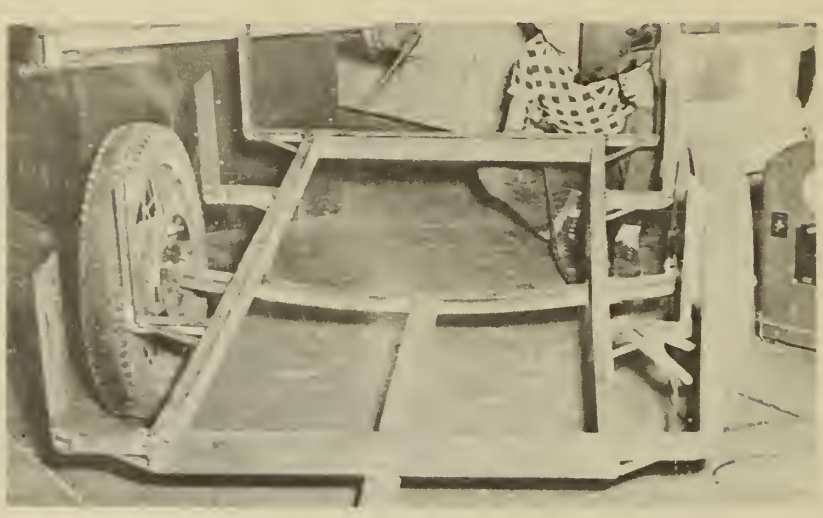


STEEL FRAME PLAN



GATE LATCH DETAIL

FARM TRAILER



SUGGESTED PROCEDURE

Secure a used car front axle with wheels and tires. Spindles are welded securely in place to hold wheels in line.

Trailer frame is made by welding two angles together to form a channel The corners are miter cut and welded. A tongue is made by welding two angle irons together in the form of a box. Frame and tongue are welded to each other and to the axle.

Side supports are made of angle stock, cut and bent to shape. Small pieces of plate are welded into the cut-out section. The supports are welded to the frame and are reinforced with strap iron braces, as shown. Frame members and side supports are drilled to permit belting the box in place.

Four 2" x 4" crosspieces are bolted to the frame and the box floor is nailed on. The trailer sides are bolted to the side supports. A hinged end gate is placed in each end of the trailer box.

BILL OF MATERIALS

48 ft. - 1 1/2" x 1 1/2" x 3/16" angle iron
12 ft. - 2" x 2" x 1/4" angle iron
4 ft. - 1" x 1" x 1/8" angle iron
8 ft. - 1 1/2" x 1/4" flat stock
2 - 1" x 12" x 10 ft.
8 - 1" x 4" flooring
1 - 2" x 4" x 16'
2 pairs - 6" strap hinges
Used auto front axle with wheels and tires.
Bolts, nails paint, welding rod.

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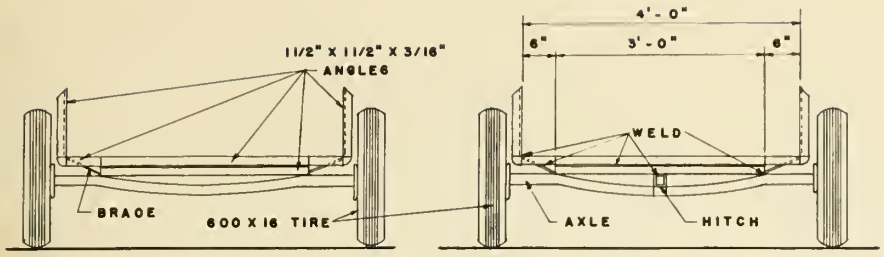
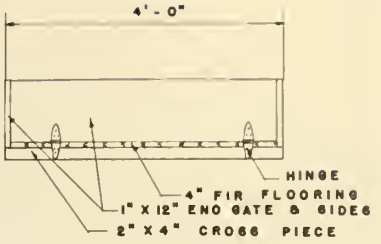
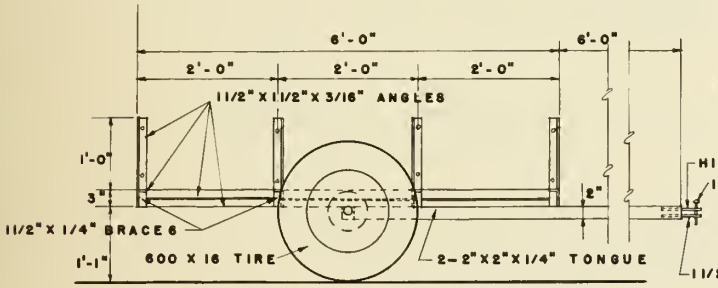


FRAME – REAR VIEW

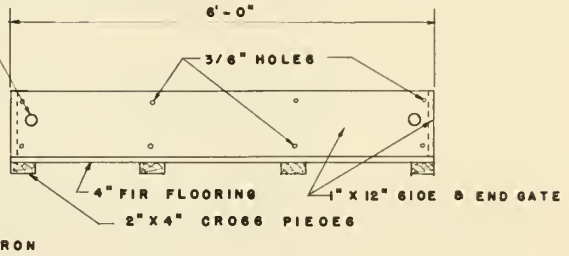
FRAME – FRONT VIEW



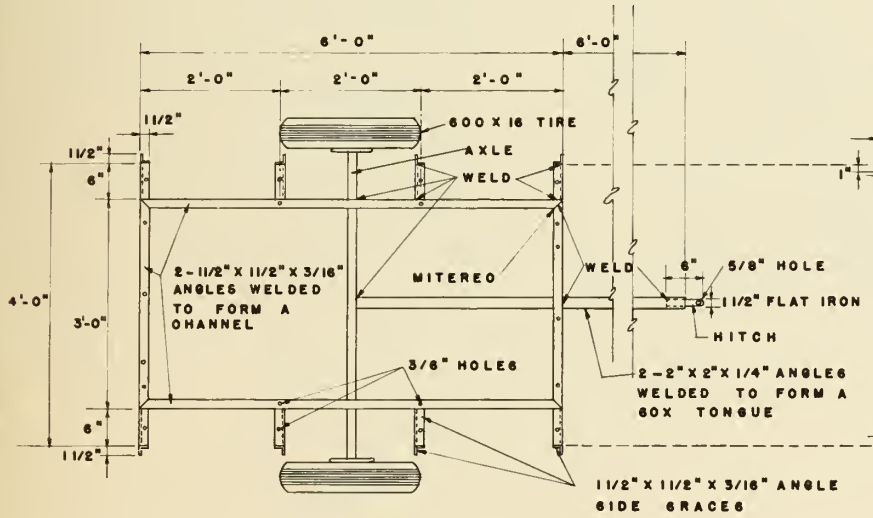
BED – FRONT & REAR VIEW



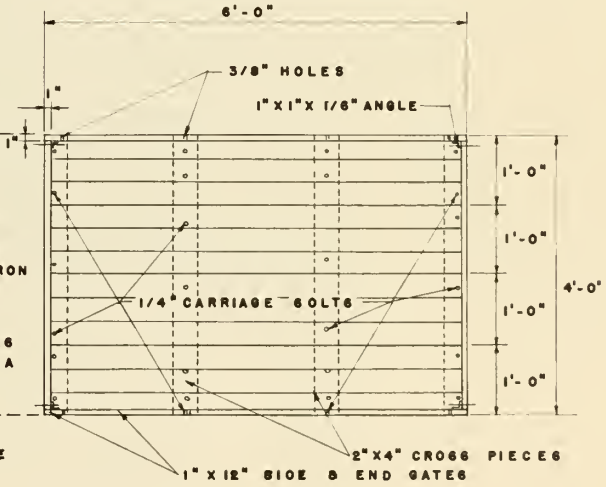
FRAME – ELEVATION



BED – ELEVATION



FRAME – PLAN



BED – PLAN

PORTABLE TRAILER CHUTE

SUGGESTED PROCEDURE

Cut and assemble the framework for the chute. Note that the uprights are welded to the 2 1/2" pipe runners in a vertical position when the chute is in loading position. The 1 1/4" pipe floor supporters are welded on top of the runners and the long ones are placed next to the bottom of the uprights. The 1 1/4" pipe braces are then welded in place to hold the sides plumb. The 1" pipes are welded on the inside of the uprights spaced down from the top. Floor is 2" x 12" rough planks and the solid sides are made of 1" x 6" rough boards. Wooden anti-slip cleats are bolted to the floor at 10" intervals.

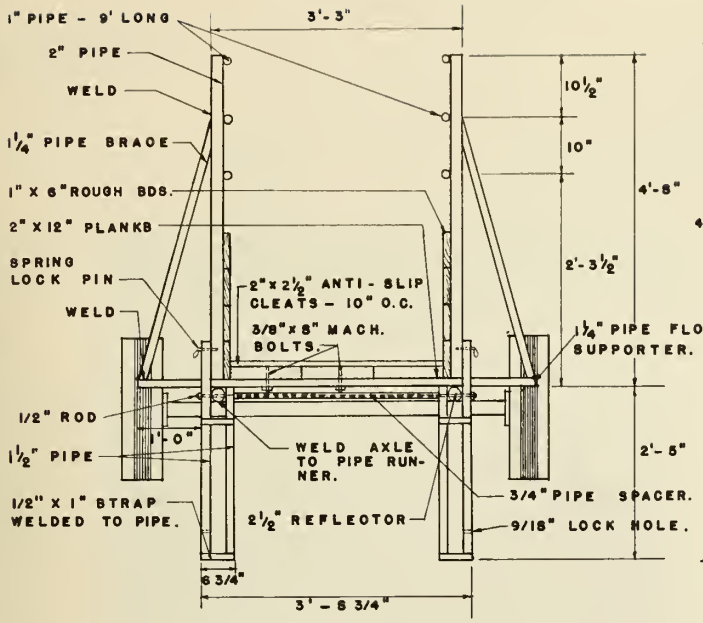
An automobile front axle with spindles welded rigid is used. It is welded to the 2 1/2" pipe runners.

The construction of the retractable hitch and the movable front end supports should be noted carefully. The front end supports must move freely and lock securely in both the loading and portable positions.

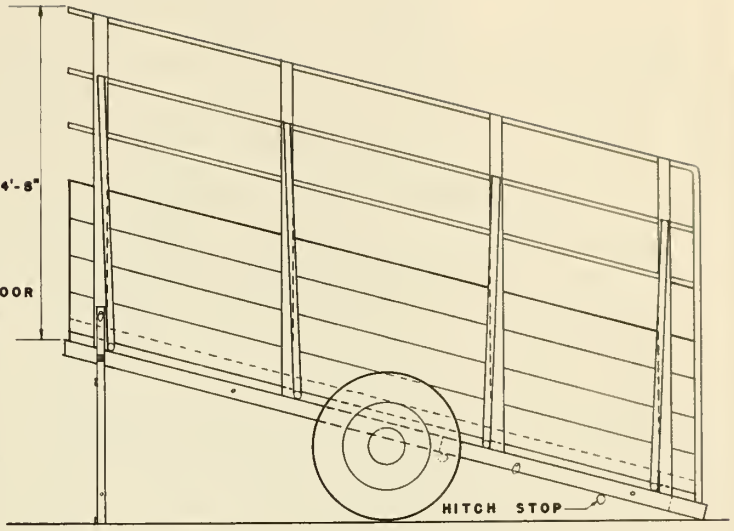
BILL OF MATERIALS

18 ft. - 2 1/2" pipe
50 ft. - 2" pipe
10 ft. - 1 1/2" pipe
40 ft. - 1 1/4" pipe
54 ft. - 1" pipe
3 1/2 ft. - 3/4" pipe
2 1/2 ft. - 1" x 1/2" flat iron
3 - 2" x 12" x 9' rough planks
11 - 2" x 2 1/2" x 3' wood anti-slip cleats
8 - 1" x 6" x 9' rough boards
Auto front axle, wheels, and tires
Bolts
Welding Electrode

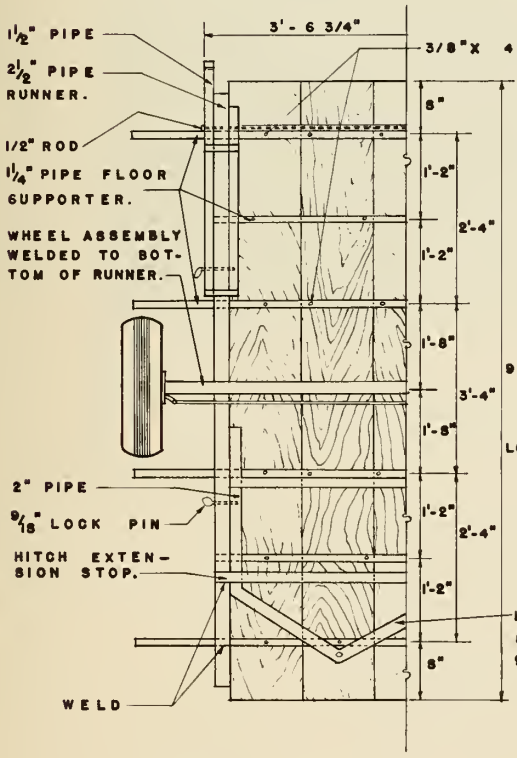
* * * * *



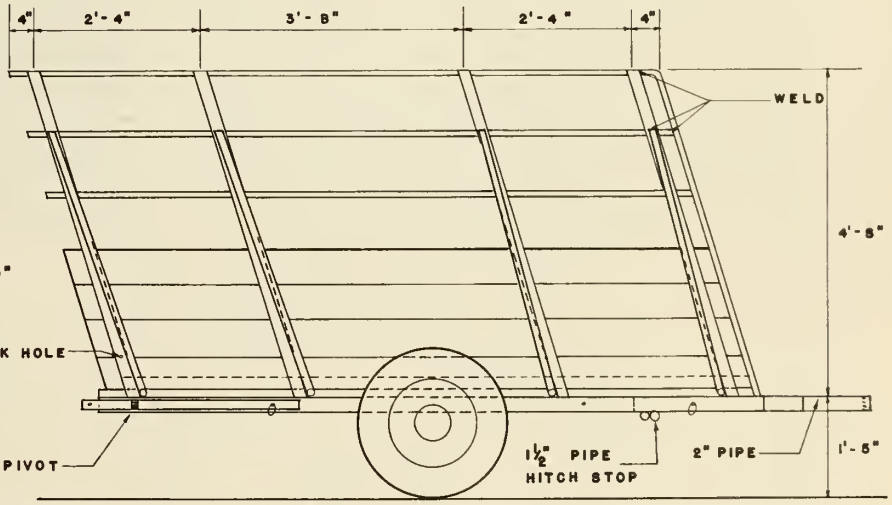
REAR VIEW



LOADING POSITION



BOTTOM VIEW



HITCH SLIDES ON HITCH EXTENSION STOP AND HELD IN POSITION BY 9/16" LOCK PINS.

PORTABLE POSITION

STOCK TRAILER

SUGGESTED PROCEDURE

Axle is formed from two 3" channels welded in form of box with commercial spindles welded in ends. Truck springs are fastened to this axle with U-bolts. Cut pieces and weld up frame, attaching it to the springs with spring hangers. Fenders are made of diamond plate iron welded to angle iron supports.

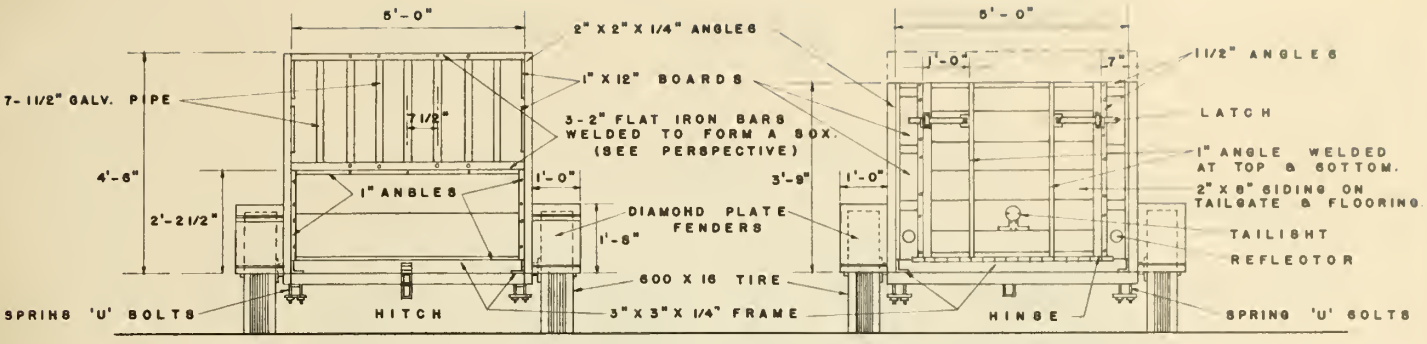
Top and bottom supports for the 1 1/2" pipe front stanchions are made by welding three 2" bars together in form of box. Three pipes are welded in place as shown while remaining four are bolted so that they may be used as stanchions for two animals.

Floor and rear tailgate are made of 2" x 8" planks. Sides and front panel below the stanchions are made of 1" x 12" boards. Rear tailgate hinges at bottom and is used as a loading ramp. Hinge is made of 1/2" pipe cut into 4" pieces. Alternate pieces are welded to the frame and tailgate respectively. A 5/8" rod is used as a hinge pin.

BILL OF MATERIALS

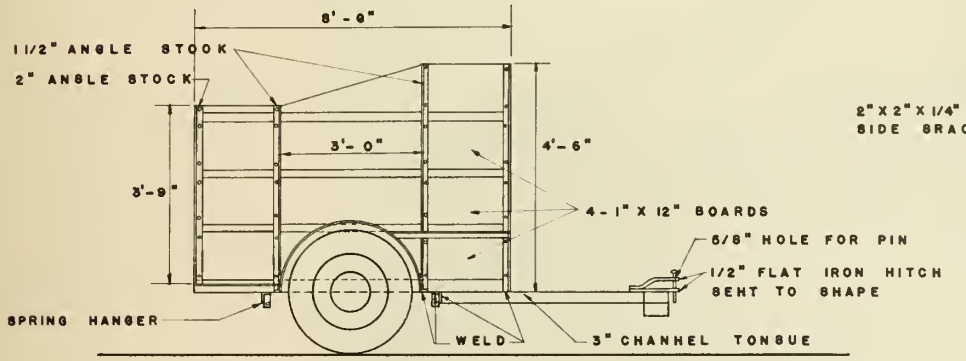
23 ft. - 3" channel iron
33 ft. - 3" x 3" x 1/4" angle
20 ft. - 2" x 2" x 1/4" angle
62 ft. - 1 1/2" x 1 1/2" x 1/4" angle
22 ft. - 1" x 1" x 1/4" angle
30 ft. - 2" x 1/4" flat iron
3 ft. - 1 1/2" x 1/4" flat iron
2 ft. - 2" x 1/2" flat iron
18 ft. - 1 1/2" pipe
5 ft. - 1/2" pipe
5 ft. - 5/8" rod
20 ft. - Diamond plate, 12" wide
1 pair truck springs, U-bolts & hangers
1 pair spindles, wheels and tires
11 - 2" x 8" x 6' 9" planks
6 - 2" x 8" x 5' planks
8 - 1" x 12" x 6' 9" boards
2 - 1" x 12" x 5' boards
Bolts
Welding Electrode

* * * * *

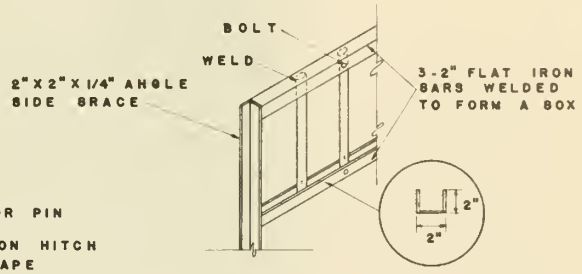


FRONT VIEW OF STANCHION

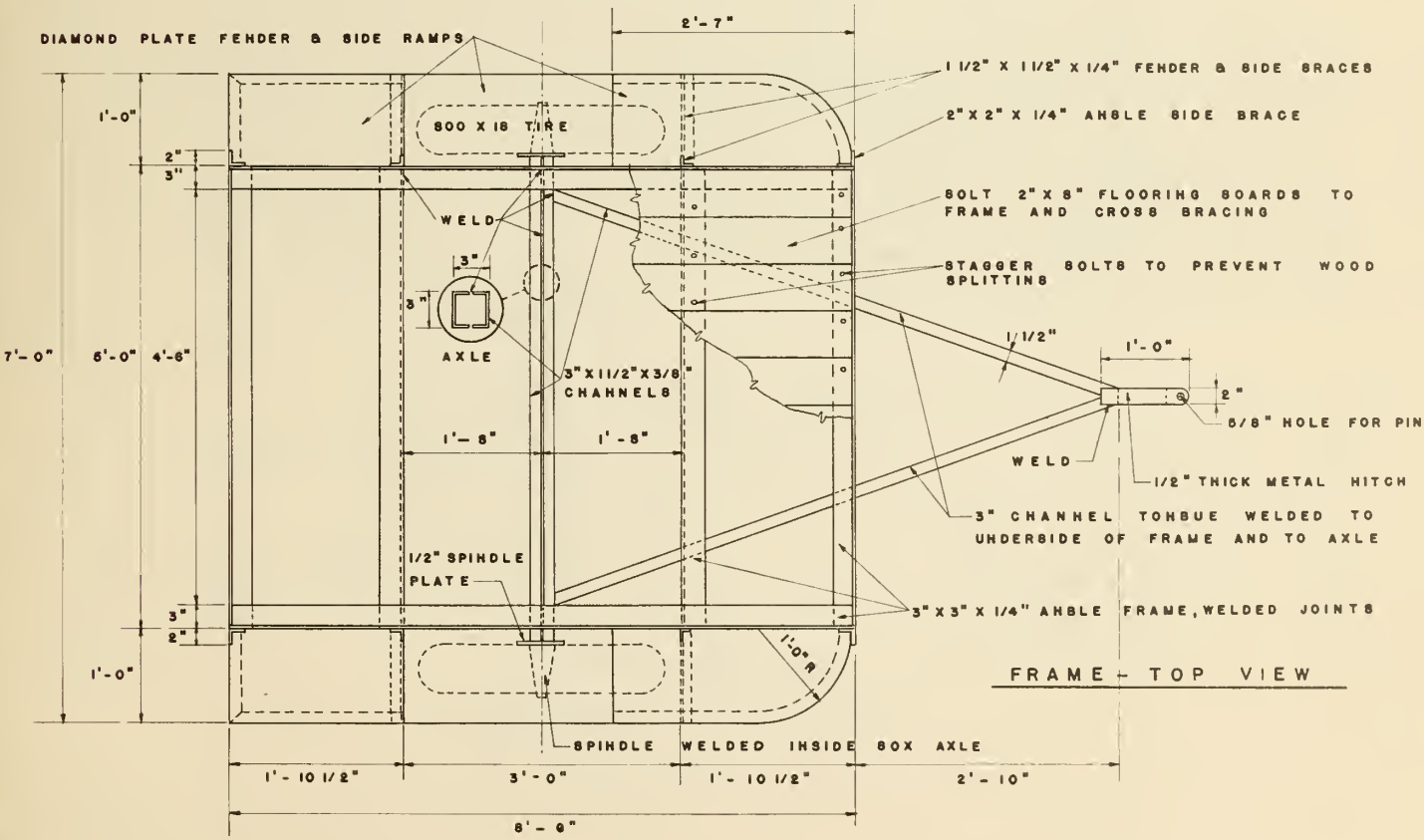
REAR VIEW OF TAILGATE



SIDE VIEW



PERSPECTIVE VIEW OF STANCHION



FRAME - TOP VIEW

2-WHEEL UTILITY TRAILER

SUGGESTED PROCEDURE

Cut materials and weld frame together. Front spring hangers are welded directly to the frame channels. Rear hangers are fastened to the cross channel. Axle is fastened to the main and overload springs by U-bolts.

The box is made with a bottom of 2" x 6" tongue and groove flooring bolted to four 2" x 4" crosspieces. Sides and ends are 1 1/4" x 12" clear fir. Endgates slide between angle iron cleats and are held in place by 3/8" rods. Box will hold nearly 30 bushels of grain.

BILL OF MATERIALS

20 ft. - 5" channel	Front axle of car with wheels, tires,
11 ft. - 4" channel	springs, overloads, U-bolts and hangers
12 ft. - 2" x 2" x 1/4" angle	4 - 2" x 4" x 3'6" crosspieces
8 ft. - 1" x 1" x 1/4" angle	8 - 2" x 6" x 10' tongue and groove flooring
3 ft. - 6" x 3/16" plate	2 - 1 1/4" x 12" x 14' clear fir boards
4 ft. - 2" x 1/2" flat iron	Bolts
8 ft. - 3/8" rod	Welding electrodes

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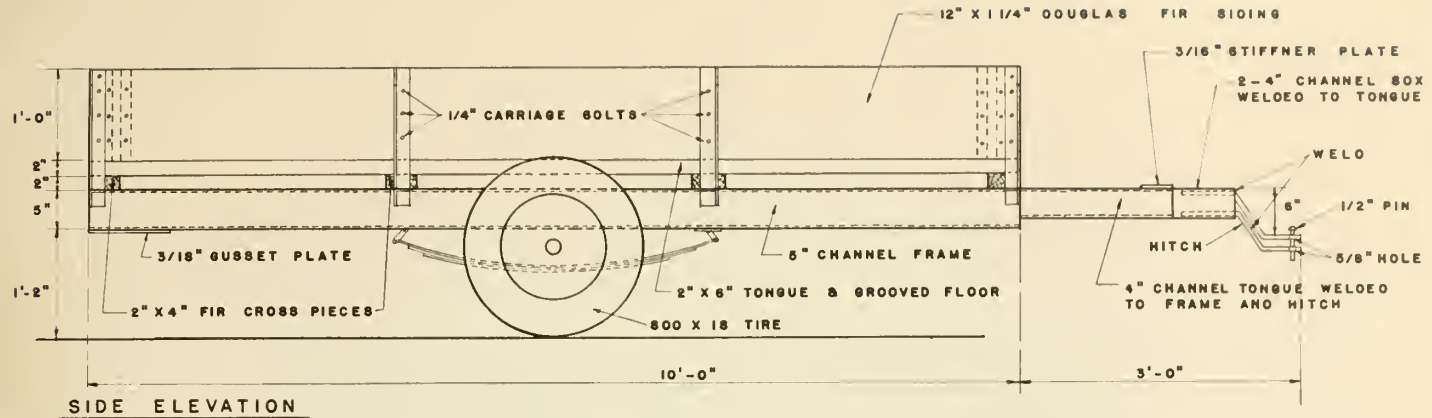
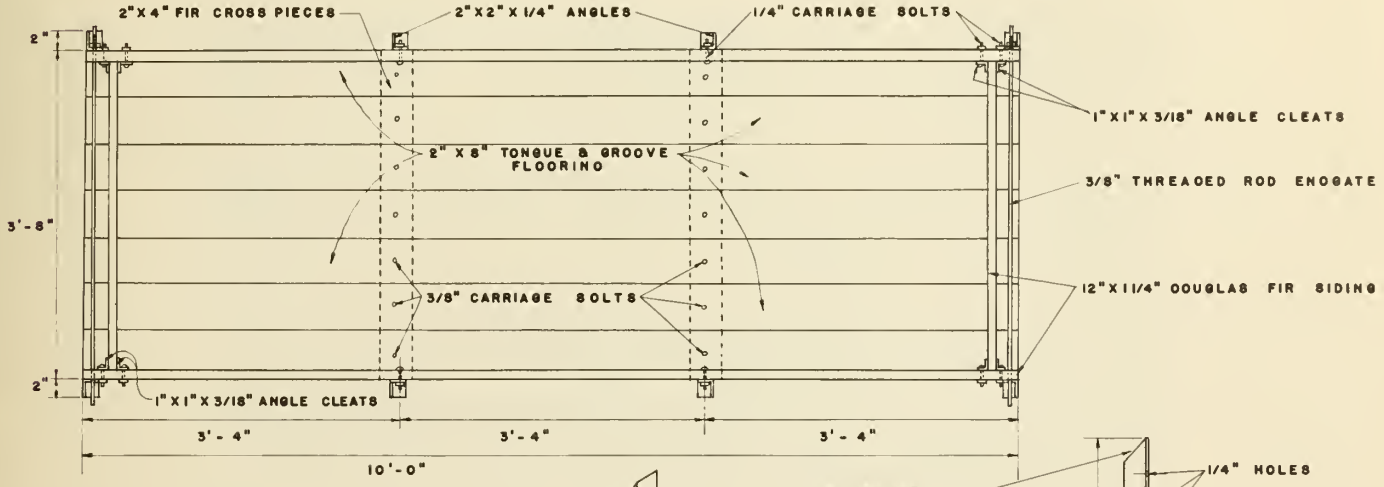
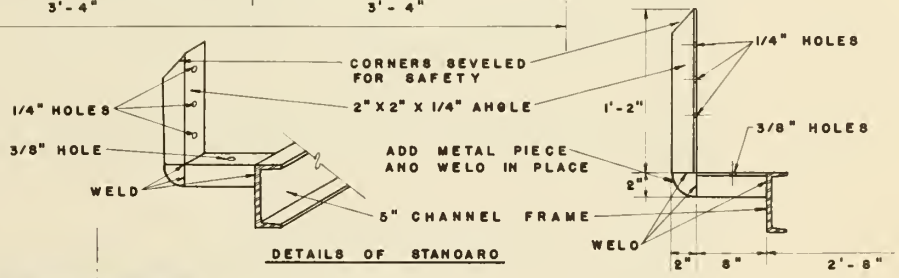


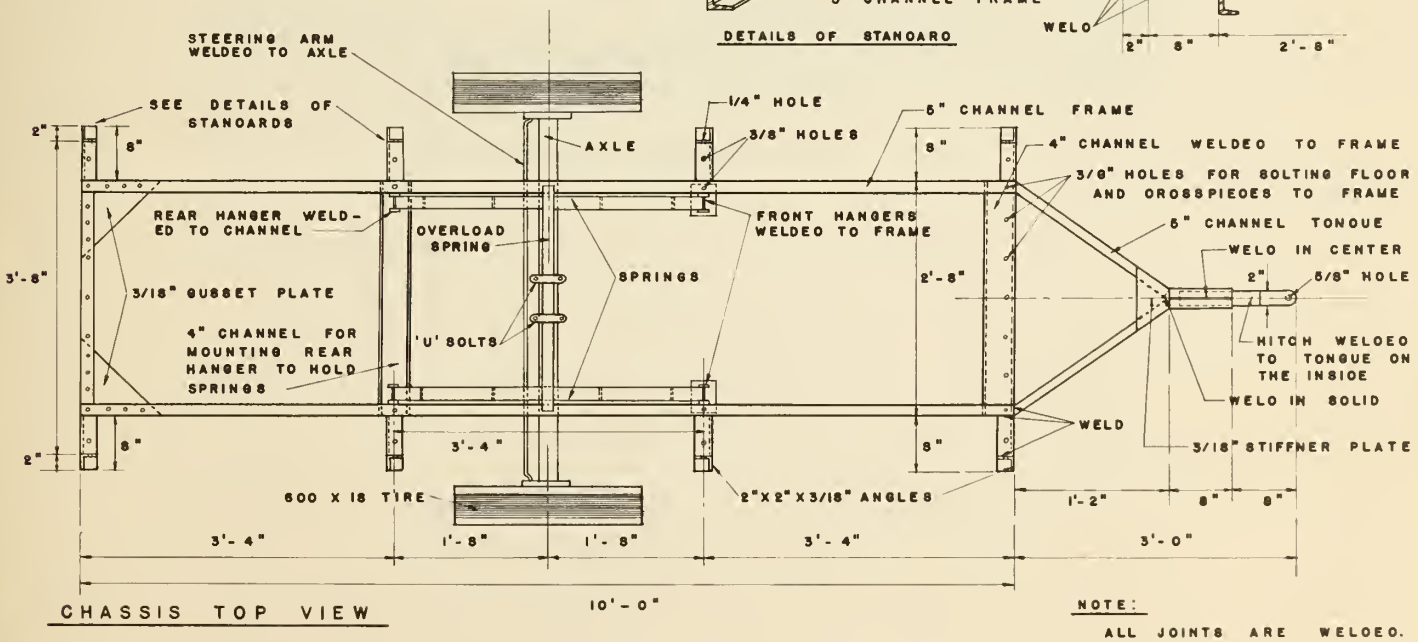
SIDE ELEVATION



BOX TOP VIEW



DETAILS OF STANDARD



CHASSIS TOP VIEW

NOTE:
ALL JOINTS ARE WELDED.

The following are suggested for additional project plans and for instructional aid in arc welding and related skills. All are available from The James F. Lincoln Arc Welding Foundation, Cleveland 17, Ohio.

"*Farm Arc Welding,*" over 440 pages of drawings, plans, photographs and instructions for hundreds of different kinds of farm equipment. Contains general shop and welding information. Price $2.00.

"*Arc Welding Lessons For School and Farm Shop,*" a book for learning the various skills used with arc welding equipment: welding, cutting, brazing, heating, soldering, hard surfacing. 343 pages; 550 illustrations; 26 pages of welded projects; price $1.00.

"*Metals and How to Weld Them,*" explains structure of metals, their properties, complete welding procedures. 322 pages; 170 illustrations. Price $2.00.

"*Welding Helps For Farmers,*" a book with 448 pages and 310 illustrations containing hundreds of farm welding ideas, described by farmers in a previous award program. Price $1.00.

"*Arc Welding,*" a 44-page manual on arc welding, giving information on welding equipment and instructions on learning to weld and other helpful information. Price 50 cents.

"*Welding Projects for School Shops,*" a 44-page booklet of 25 Industrial Arts shop projects; detailed plans and suggestions for making projects from simple wire figures to furniture and shop tools. Price 50 cents.

All prices include postage. Add 50c for delivery outside U.S.A.

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